TYPE I HOODS
COMMERCIAL
COOKING OPERATIONS
A BUILDING AND FIRE CODE
OFFICIAL REGULATORY PERSPECTIVE

FACTS

- There are approximately 8,160 structure fires at eating and drinking establishments each year
- More than 50% of these fires were caused by cooking equipment
- Over 500 injuries to kitchen staff
- Over 100 million in direct fire loss
- Many of the business close and never reopen
- Another fact not mentioned is the risk to firefighting personnel!
INTRODUCTIONS

- WHO ARE YOU AND WHAT IS YOUR DISCIPLINE
- WHY ARE YOU TAKING THIS COURSE
- WHAT DO YOU EXPECT TO TAKE AWAY FROM THIS COURSE (BESIDES .7 CEU’S)
- HAVE YOU BEEN INVOLVED IN PLAN REVIEW OR INSPECTIONS OF THESE SYSTEMS

COURSE EXPECTATIONS

- LEARNING OUTCOMES:
  - LEARN ALL OF THE ASSOCIATED CODES AND REFERENCED STANDARDS INVOLVED
  - UNDERSTAND HOW THESE SYSTEMS ARE DESIGNED AND HOW THEY FUNCTION
  - LEARN HOW THE CODES AND REFERENCED STANDARDS DON’T NECESSARILY SPEAK WELL TO EACH OTHER
  - LEARN THE VITAL COMPONENTS OF THESE SYSTEMS AND HOW THEY ARE INSPECTED
  - MOST IMPORTANTLY, LEARN THAT ACCEPTANCE TESTING IS NOT A SOLE FUNCTION OF THE FIRE DEPARTMENT
### QUESTIONS

- How many have been involved in firefighting a kitchen fire?
- How many have experienced difficulty in opening a door to a restaurant?
- How many have smelled like the restaurant after leaving?
- How many realize that a comprehensive inspection of these systems require:
  - Fire
  - Building
  - Mechanical
  - Electrical & Fuel-Gas
  - NFPA 17A and NFPA 96

### COURSE TITLE?

- IFC – Commercial Kitchen Hoods & Commercial Cooking Operations
- IMC – Commercial Kitchen Hood Ventilation System Ducts & Exhaust Equipment
- What are we talking about here; the hoods, the operations, the fire-extinguishing system, the ventilation and exhaust equipment?
- A single document that captures all of the requirements – perhaps: “Commercial Cooking Operations and Equipment”

### COMMERCIAL COOKING SYSTEMS

- Systems include:
  - Cooking Equipment (Appliances) – NFPA 96 and IMC
  - Commercial Cooking Operations – IFC and IBC
  - Hoods (Capture, Containment, and Conveyance) – NFPA 96 and IMC
  - Fire-Extinguishing System – IFC, UL300 and NFPA 17A
  - Ventilation and Exhaust Requirements – IMC, NFPA 96 and NFPA 17A
  - Electrical Provisions – NFPA 70 (NEC)
  - Fuel Gas Provisions – IFGC
  - Appliances – UL
2018 IFC

- DOES THE IFC ADDRESS ALL OF THESE CONCERNS?
- APPLICABLE IFC SECTIONS:
  - SECTION 607 COMMERCIAL KITCHEN HOODS
  - SECTION 608 COMMERCIAL KITCHEN COOKING OIL STORAGE
  - 903.2.11.5 COMMERCIAL COOKING OPERATIONS
  - 904.5 WET-CHEMICAL SYSTEMS
  - 904.12 COMMERCIAL COOKING SYSTEMS
  - 906.4 COOKING EQUIPMENT FIRES

2018 IBC

- 903.2.11.5 COMMERCIAL COOKING OPERATIONS
- 904.2.2 COMMERCIAL HOOD AND DUCT SYSTEMS
- 904.12 COMMERCIAL COOKING SYSTEMS
- 906.4 COOKING EQUIPMENT FIRES
- MIRRORS THE IFC FOR THE MOST PART – WHY?

2018 IMC

- CHAPTER 4 VENTILATION
- SECTION 507 COMMERCIAL KITCHEN HOODS
- SECTION 508 COMMERCIAL KITCHEN MAKEUP AIR
- SECTION 509 FIRE SUPPRESSION SYSTEMS
- SECTION 917 COOKING APPLIANCES
IFGC

401.1 SCOPE.

THIS CHAPTER SHALL GOVERN THE DESIGN, INSTALLATION, MODIFICATION AND MAINTENANCE OF PIPING SYSTEMS. THE APPLICABILITY OF THIS CODE TO PIPING SYSTEMS EXTENDS FROM THE POINT OF DELIVERY TO THE CONNECTIONS WITH THE APPLIANCES AND INCLUDES THE DESIGN, MATERIALS, COMPONENTS, FABRICATION, ASSEMBLY, INSTALLATION, TESTING, INSPECTION, OPERATION AND MAINTENANCE OF SUCH PIPING SYSTEMS.

NATIONAL ELECTRICAL CODE

NFPA 70-17

REFERENCED STANDARDS - IFC

WHAT IS A REFERENCED STANDARD AND HOW CAN THEY BE USED?

NFPA17A-17 STANDARD FOR WET CHEMICAL EXTINGUISHING SYSTEMS

NFPA 96-17 STANDARD FOR VENTILATION CONTROL AND FIRE PROTECTION OF COMMERCIAL COOKING OPERATIONS

UL 300-05(R2010) FIRE TESTING OF FIRE EXTINGUISHING SYSTEMS FOR PROTECTION OF COMMERCIAL COOKING EQUIPMENT—WITH REVISIONS THROUGH DECEMBER 2014
REFERENCED STANDARDS - IBC

- NFPA17A-17 STANDARD FOR WET CHEMICAL EXTINGUISHING SYSTEMS
  - 904.5, 904.12
  - WHAT’S MISSING?
  - NFPA 96

REFERENCED STANDARDS - IMC

- NFPA 96-17 STANDARD FOR VENTILATION CONTROL AND FIRE PROTECTION OF COMMERCIAL COOKING OPERATIONS
  - 507.1
  - THE IMC CAPTURES NFPA 96, SO THE IBC DOESN'T NEED TO
  - THE IFC REFERENCES ALL THREE REFERENCED STANDARDS SO WE ARE GOOD – RIGHT?
  - THE CODES ALSO REFERENCE THE OTHER ICC CODES BUT ONLY SPECIFIC SECTIONS
  - LET'S LOOK AT THE REFERENCE BACK TO THE IMC - HTTPS://CODES.ICCSAFE.ORG/DASHBOARD

UL300 - THE HISTORY

- WHY A UL 300 SYSTEM
  - PRIOR TO 1994, MOST COMMERCIAL COOKING INVOLVED ANIMAL FAT. THE DEEP FRYERS THAT WERE USED WERE POORLY INSULATED WHICH MADE COOKING TEMPERATURES INCONSISTENT AND INEFFICIENT. THE EXTINGUISHING SYSTEM THAT PROTECTED THOSE KITCHENS WERE DRY-CHEMICAL SYSTEMS REGULATED BY NFPA 17. COOKING TEMPERATURES TYPICALLY RANGED BETWEEN 200 AND 300 DEGREES. THE MOST COMMON TYPE WAS ANSUL AND TO THIS DAY MANY REFER TO THESE SYSTEMS AS “ANSUL-SYSTEMS”
TODAY’S COOKING MEDIA

• Due to the health craze, vegetable oils and other synthetic oils are being used in lieu of animal and other fatty oils. Temperatures are much higher using these oils and can be in the 500 degree range. Today’s fryers are well insulated and have excellent heat retention so dry chemical systems are no longer capable of controlling a fire.
• UL tested these deep fat fryers using the new exotic oils and although the initial fire was knocked down using dry-chemical the fire reignited due to the high temperatures and vapors off gassed by the extremely hot liquid.
• There were also reports of dust explosions from the release of the dry-chem

PHASE OUT PERIOD

• Most communities and earlier versions of the fire code allowed these systems to be phased out. Retro-fitting a UL300 system was triggered when:
  • The existing system was altered
  • The existing system had a discharge
  • A substantial remodel took place
  • Low heat oils such as animal fat had to continue to be used
  • That was 24 years ago!

NFPA 17A

• NFPA 17 is the standard that regulates dry-chemical systems
• NFPA 17A was developed to address UL300 systems
• These systems are known as wet-chemical systems
• The extinguishing agent is 50% water - on grease fires
• The wet-chemical solution includes a potassium carbonate mixed with water to form an alkaline solution. That is capable of upsetting the chemical chain reaction known as fire and simultaneous cooling of the fire and equipment.
TYPE K SYSTEMS

- These UL300 systems are sometimes referred to as Type K systems.
- Type K fire extinguishers are also required as part of the commercial kitchen operation.
- What does Type K refer to?
  - Kitchen

PERIODIC TABLE OF THE ELEMENTS

- Who conducts the plan reviews on these systems?
- Is the plan review conducted from the IFC and applicable referenced standards?
- Who handles the building, mechanical, electrical, and fuel gas side of the review?
PRESCRIPTIVE VERSUS ENGINEERED SYSTEMS

- What is the difference and where are the prescriptive provisions found?
- Plan review elements:
  - Floor plans – IBC (WHY)
  - Mechanical ventilation and exhaust – IMC and NFPA 96
  - Electrical – NEC
  - Fuel gas – IFGC (WHY)
  - Suppression and components – IFC and NFPA 17A
  - Appliances – Manufacturer installation instructions

TYPE I HOODS

Types of hoods - IMC
- Commercial kitchen hoods:
  - Backshelf hood
  - Designed to exhaust the grease-laden vapor closer to the height of the cooking equipment.
  - Front edge typically setback about 6 inches from the front of the cookline.
  - Offers spillage potential

FIGURE 3-15: BACKSHELF HOOD OVER COOKLINE
TYPES OF HOODS - IMC

- Wall Canopy Hood
  - By far the most popular
  - In nearly all cases, a makeup air hood will be of a canopy hood design!
- Who regulates this area?

- Eyebrow Hood
  - Traditionally used over ovens where there is not a heavy load of grease-laden vapors.
  - Considered light-duty and doesn’t require a suppression system.

IBC PLAN REVIEW

- Floor plan and supporting documentation
  - Building makeup – combustible versus noncombustible
  - Floor to ceiling – ceiling to roof deck – floor penetrations
  - Roof height and proximity of adjacent structures
  - Roofing material and pitch
  - Beams, electrical, mechanical obstructions
  - Historical upgrades
  - Electrical capacity
  - Fuel gas capacity
  - Other issues
  - Fire separations, hurdle ratings, clearance to combustibles
Buildings are required to adhere to regulations regarding indoor air quality and sometimes exhaust air quality. The food service industry must meet higher air quality standards due to the type of contaminated air produced by food cooking.

The 3 C's:
- Capture – Grease-laden vapors, etc.
- Containment – Hood system, spillage
- Conveyance – Exhaust system and make-up air
BASIC CONCERNS AND MANAGEMENT

01 Fire = suppression
02 Smoke = capture, containment and conveyance
03 Odor = exhaust
04 Grease = collection and cleaning

COOKING SMOKE - CAPTURE

- Smoke particles are extremely small and not visible to the human eye unless thousands of them are grouped together to form what we see as smoke.
- Smoke generated by commercial cooking has a particulate size of 0.3 to 0.8 microns and it is these very small particles that smoke abatement equipment must remove from the air stream.
- The density of the smoke (opacity) is measured from 0% to 100% and char broilers and other heavy smoke producing equipment has an opacity level of 60% to 70%.

ODOR - CONTAINMENT

- Cooking odors (molecules) generated by the combustion of animal and vegetable matter result in a extremely complex mixture of reactive organic gases (ROG's).
- A small percentage of these odors may be absorbed by grease particulates but the majority exist separately in the airstream.
- Odor management needs to take place through a media bed such as activated charcoal, odor-oxidant media (potassium permanganate), or through finely atomized water sprays.
GREASE

- Grease particulates are measured in terms of microns, and grease generated by commercial cooking equipment has a particulate size of 10 microns and up.
- The grease extraction efficiency of the exhaust hood plays an important role in the operation and performance of fire and pollution.

EXHAUST AIR

- Exhaust air is the starting point in restaurant kitchen ventilation. Exhaust air is the air which is contaminated with smoke and grease-laden vapor (aerosols) created from the cooking source. This air must be removed from the building.

REPLACEMENT AIR

- Make-up air or supply air must be provided in approximately equal amounts to the air being exhausted.
- The typical procedure is to supply outside air through a designed make-up air system.
- For efficient ventilation, it is necessary to maintain a slight negative pressure in the kitchen area. Air currents will naturally move from a higher (positive) pressure area to a lower (negative) pressure area. Ideally, air will passively move from the dining area to the kitchen and retain odors and pollutants.
LISTED HOODS

- Captivate is the most common.
- "Those systems having predetermined flow rates, nozzle pressures, and quantities of extinguishing agent and having specific pipe size, maximum and minimum pin sensitive, flexible hose specifications, number of fittings, number and types of nozzles and predetermined ventilation and exhaust rates."
- The science of commercial kitchen ventilation includes both exhausting and replacing air within the cooking area.

Listed hoods are allowed to operate at their listed flow rates by exception in the building code. Most manufacturers of listed hoods verify their listed flow rates by conducting the tests per UL Standard 710. Typically, the average flow rates are much lower than those dictated by code. The test provides minimum efficiencies and the hood must be in a controlled environment free of some ambient conditions that can adversely affect capture.

System commissioning is a must with these listed units to verify the cfm rates!

LISTED SYSTEMS

- Listed systems doesn’t mean that a plan review is not needed!!!
- Drawings must show:
  - Fire and smoke dampers and heat stops
  - Hourly ratings, penetrations, thickness and type of fire-resistive ratings
  - Calculations on exhaust hood, ductwork, fan system, and means to provide adequate make-up air.
  - Filters, baffles, grease ducts, exhaust fan details
  - Cut sheets for all listed materials and appliances
  - Manufacturer installation instructions
SCHEMATIC

- This is not sufficient for a plan review.

DUCTS

- General requirements for ductwork:
  - Clearance to combustibles
  - Access for inspection and maintenance
  - Dimensional stability
  - Containment – leakage control
  - Vibration and noise
  - Exposure to damage, weather, temperatures
  - Support and reinforcement
  - Thermal conductivity

EXHAUST DUCTS

- Exhaust ducts serving Type I hoods must be continuously welded, liquid tight, and be 300° C (572° F) smoke resistant.
- Must be constructed of 60% or 80% stainless steel and have adequate access to ensure proper removal of potential grease build up.
- The ducts must be securely fastened to the structure and no fasteners can penetrate the ducts.
- All ducts must be installed without forming dips or traps.
- Duct systems shall not be interconnected with any other Exhaust, Ventilation or Return Duct System.
- Review ducts serve Type I.
DUCT ENCLOSURES

- Nearly all buildings require an approved continuous fire-rated enclosure of the exhaust duct from the ceiling to the roof or fan.

LISTED ENCLOSURE SYSTEMS

- There are two categories of listed enclosure systems:
  - Factory-built grease duct enclosure assembly
    - These ducts are generally double walled, constructed with an inner skin of 304 or 316 stainless steel and an outer jacket of either aluminumized steel or 304/316 stainless and must be installed per manufacturer specs.
  - Listed duct wrapping assemblies (blankets)
    - There are a number of wrapping systems on the market. They can either be foil lined padding or rigid board in composition. Flexible wraps are made of ceramic fiber which basically cocoon the duct. Rigid boards are made of calcium silicate. Must be installed per manufacturer specs.

UL LISTED DUCT WRAP

- UL listed duct wrap
- 304 Stainless steel banding
- Wing seals
- UL Listed Ful tape
EXHAUST FANS

- Kitchen Exhaust, due to cooking operations, contain emissions, vapor, fumes, smoke, and odors. The use of the exhaust fan is to create sufficient airflow to move these gases and odors away from the hood and duct to a point outside the building.

- Fans should be the centrifugal type with backward inclined blades. The fan housing must be hinged to tip up or otherwise be accessible for cleaning.

ACCEPTANCE TEST

- Who has conducted an acceptance test on a Type I hood system?
- What components did you look at?
- Who looks at the mechanical side?

This course is designed to enable either a fire code official or a building code official to conduct the entire acceptance test. Typically, if the building side conducts the test, some fire components may be missed, and vice versa! Therefore, it is important to know all the applicable codes.
THE MECHANICAL CODE – 2018 IMC

• SECTION 506 COMMERCIAL KITCHEN HOOD VENTILATION SYSTEM DUCTS AND EXHAUST EQUIPMENT

• 506.3.1 DUCT MATERIALS.

• DUCTS SERVING TYPE I HOODS SHALL BE CONSTRUCTED OF MATERIALS IN ACCORDANCE WITH SECTIONS 506.3.1.1 AND 506.3.1.2.

• 506.3.1.1 GREASE DUCT MATERIALS.

• GREASE DUCTS SERVING TYPE I HOODS SHALL BE CONSTRUCTED OF STEEL HAVING A MINIMUM THICKNESS OF 0.0575 INCH (1.463 MM) (NO. 16 GAGE) OR STAINLESS STEEL NOT LESS THAN 0.0450 INCH (1.14 MM) (NO. 18 GAGE) IN THICKNESS.

• EXCEPTION: FACTORY-BUILT COMMERCIAL KITCHEN GREASE DUCTS SERVING TYPE I HOODS LISTED AND LABELED IN ACCORDANCE WITH UL 1978 AND INSTALLED IN ACCORDANCE WITH SECTION 506.3.

BAD GREASE DUCTS

GOOD GREASE DUCT
506.3.1.2 MAKEUP AIR DUCTS.

• MAKEUP AIR DUCTS CONNECTING TO OR WITHIN 18 INCHES (457 MM) OF A TYPE I HOOD SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH SECTIONS 603.1, 603.3, 603.6, 603.9, 603.10, AND 603.12. DUCT INSULATION INSTALLED WITHIN 18 INCHES (457 MM) OF A TYPE I HOOD SHALL BE NONCOMBUSTIBLE OR SHALL BE LISTED FOR THE APPLICATION.

506.3.2 JOINTS, SEAMS AND PENETRATIONS OF GREASE DUCTS.

• JOINTS, SEAMS AND PENETRATIONS OF GREASE DUCTS SHALL BE MADE WITH A CONTINUOUS LIQUID-TIGHT WELD OR BRAZE MADE ON THE EXTERNAL SURFACE OF THE DUCT SYSTEM.

• EXCEPTIONS:
  1. PENETRATIONS SHALL NOT BE REQUIRED TO BE WELDED OR BRAZED WHERE SEALED BY DEVICES THAT ARE LISTED FOR THE APPLICATION.
  2. INTERNAL WELDING OR BRAZING SHALL NOT BE PROHIBITED PROVIDED THAT THE JOINT IS FORMED OR GROUND SMOOTH AND IS PROVIDED WITH READY ACCESS FOR INSPECTION.
  3. FACTORY-BUILT COMMERCIAL KITCHEN GREASE DUCTS LISTED AND LABELED IN ACCORDANCE WITH UL 1978 AND INSTALLED IN ACCORDANCE WITH SECTION 304.1.

EXTERNAL WELDS
506.3.2.1 DUCT JOINT TYPES.

- **DUCT JOINTS SHALL BE BUTT JOINTS, WELDED FLANGE JOINTS WITH A MAXIMUM FLANGE DEPTH OF 1/2 INCH (12.7 MM) OR OVERLAPPING DUCT JOINTS OF EITHER THE TELESCOPING OR BELL TYPE. OVERLAPPING JOINTS SHALL BE INSTALLED TO PREVENT LEDGES AND OBSTRUCTIONS FROM COLLECTING GREASE OR INTERFERING WITH GRAVITY DRAINAGE TO THE INTENDED COLLECTION POINT. THE DIFFERENCE BETWEEN THE INSIDE CROSS-SECTIONAL DIMENSIONS OF OVERLAPPING SECTIONS OF DUCT SHALL NOT EXCEED 1/4 INCH (6.4 MM). THE LENGTH OF OVERLAP FOR OVERLAPPING DUCT JOINTS SHALL NOT EXCEED 2 INCHES (51 MM).**

506.3.2.2 DUCT-TO-HOOD JOINTS.

- **DUCT-TO-HOOD JOINTS SHALL BE MADE WITH CONTINUOUS INTERNAL OR EXTERNAL LIQUID-TIGHT WELDED OR BRAZED JOINTS. SUCH JOINTS SHALL BE SMOOTH, ACCESSIBLE FOR INSPECTION, AND WITHOUT GREASE TRAPS.**

- **WITH EXCEPTIONS!**

506.3.2.3 DUCT-TO-EXHAUST FAN CONNECTIONS.

- **DUCT-TO-EXHAUST FAN CONNECTIONS SHALL BE FLANGED AND GASKETED AT THE BASE OF THE PAN FOR VERTICAL DISCHARGE FANS, SHALL BE FLANGED, GASKETED AND ROUTED TO THE INLET OF THE PAN FOR SIDE-INLET UTILITY FANS, AND SHALL BE FLANGED, GASKETED AND ROUTED TO THE INLET AND OUTLET OF THE PAN FOR IN-LINE FANS. GASKET AND SEALING MATERIALS SHALL BE RATED FOR CONTINUOUS DUTY AT A TEMPERATURE OF NOT LESS THAN 1300°F (704°C).**
506.3.2.4 VIBRATION ISOLATION.

- A VIBRATION ISOLATION CONNECTOR FOR CONNECTING A DUCT TO A FAN SHALL CONSIST OF NONCOMBUSTIBLE PACKING IN A METAL SLEEVE JOINT OF APPROVED DESIGN OR SHALL BE A COATED-FABRIC FLEXIBLE DUCT CONNECTOR LINED AND LABELLED FOR THE APPLICATION. VIBRATION ISOLATION CONNECTORS SHALL BE INSTALLED ONLY AT THE CONNECTION OF A DUCT TO A FAN INLET OR OUTLET.

506.3.2.5 GREASE DUCT TEST.

- PRIOR TO THE USE OR CONCEALMENT OF ANY PORTION OF A GREASE DUCT SYSTEM, A LEAKAGE TEST SHALL BE PERFORMED. DUCTS SHALL BE CONSIDERED TO BE CONCEALED WHERE INSTALLED IN SHAFTS OR COVERED BY COATINGS OR WRAPS THAT PREVENT THE DUCTWORK FROM BEING VISUALLY INSPECTED ON ALL SIDES. THE PERMIT HOLDER SHALL BE RESPONSIBLE TO PROVIDE THE NECESSARY EQUIPMENT AND PERFORM THE GREASE DUCT LEAKAGE TEST. A LIGHT TEST SHALL BE PERFORMED TO DETERMINE THAT ALL WELDED AND BRAZED JOINTS ARE LEAK-TIGHT.

- A LIGHT TEST SHALL BE PERFORMED BY PASSING A LAMP HAVING A POWER RATING OF NOT LESS THAN 100 WATTS THROUGH THE ENTIRE SECTION OF DUCTWORK TO BE TESTED. THE LAMP SHALL BE OPEN SO AS TO EMIT LIGHT EQUALLY IN ALL DIRECTIONS PERPENDICULAR TO THE DUCT WALLS. A TEST SHALL BE PERFORMED FOR THE ENTIRE DUCT SYSTEM, INCLUDING THE HOOD-TO-DUCT CONNECTION. THE DUCT WORK SHALL BE PERMITTED TO BE TESTED IN SECTIONS, PROVIDED THAT EVERY JOINT IS TESTED FOR LISTED FACTORY-BUILT GREASE DUCTS. THIS TEST SHALL BE LIMITED TO DUCT JOINTS ASSEMBLED IN THE FIELD AND SHALL EXCLUDE FACTORY WELDS.

UNISTRUT WITH VIBRATION WRAP
506.3.3 GREASE DUCT SUPPORTS.

- Grease duct bracing and supports shall be of non-combustible material securely attached to the structure and designed to carry gravity and seismic loads within the stress limitations of the International Building Code. Bolts, screws, rivets and other mechanical fasteners shall not penetrate duct walls.

506.3.4 AIR VELOCITY.

- Grease duct systems serving a Type I hood shall be designed and installed to provide an air velocity within the duct system of not less than 500 feet per minute (2.5 m/s).
- How is this measured/confirmed?
- Anemometers!

506.3.5 SEPARATION OF GREASE DUCT SYSTEM.

- A separate grease duct system shall be provided for each Type I hood. A separate grease duct system is not required where all of the following conditions are met:
  1. All interconnected hoods are located within the same story.
  2. All interconnected hoods are located within the same room or in adjoining rooms.
  3. Interconnecting ducts do not penetrate assemblies required to be fire-resistance rated.
  4. The grease duct system does not serve solid-fuel-fired appliances.
506.3.6 GREASE DUCT CLEARANCES.

- WHERE ENCLOSURES ARE NOT REQUIRED, GREASE DUCT SYSTEMS AND EXHAUST EQUIPMENT SERVING A TYPE I HOOD SHALL HAVE A CLEARANCE TO COMBUSTIBLE CONSTRUCTION OF NOT LESS THAN 18 INCHES (457 MM), AND SHALL HAVE A CLEARANCE TO NONCOMBUSTIBLE CONSTRUCTION AND GYPSUM WALLBOARD ATTACHED TO NONCOMBUSTIBLE STRUCTURES OF NOT LESS THAN 2 INCHES (50 MM).

- EXCEPTION: LISTED AND LABELED – PER MANUFACTURER INSTALLATION INSTRUCTIONS!

506.3.7 PREVENTION OF GREASE ACCUMULATION IN GREASE DUCTS.

- DUCT SYSTEMS SERVING A TYPE I HOOD SHALL BE CONSTRUCTED AND INSTALLED SO THAT GREASE CANNOT COLLECT IN ANY PORTION THEREOF, AND THE SYSTEM SHALL SLOPE NOT LESS THAN ONE-FOURTH UNIT VERTICAL IN 12 UNITS HORIZONTAL (2-PERCENT SLOPE) TOWARD THE HOOD OR TOWARD A GREASE RESERVOIR DESIGNED AND INSTALLED IN ACCORDANCE WITH SECTION 506.3.7.1 WHERE HORIZONTAL DUCTS EXCEED 75 FEET (22 860 MM) IN LENGTH, THE SLOPE SHALL BE NOT LESS THAN ONE UNIT VERTICAL IN 12 UNITS HORIZONTAL (8.3-PERCENT SLOPE).

506.3.7.1 GREASE DUCT RESERVOIRS.

- Grease duct reservoirs shall:
  1. Be constructed and installed in accordance with the requirements for the grease duct they serve.
  2. Be located on the bottom of the horizontal duct or the bottommost section of the duct riser.
  3. Extend across the full width of the duct and have a length of not less than 12 inches (305 mm).
  4. Have a depth of not less than 1 inch (25 mm).
  5. Have a bottom that slopes to a drain.
  6. Be provided with a cleanout opening constructed in accordance with Section 506.3.8 and installed to provide direct access to the reservoir. The cleanout opening shall be located on a side or on top of the duct so as to permit cleaning of the reservoir.
  7. Be installed in accordance with the manufacturer’s instructions where manufactured devices are utilized.
506.3.8 GREASE DUCT CLEANOUTS AND OPENINGS.

1. GREASE DUCT CLEANOUTS AND OPENINGS SHALL COMPLY WITH ALL OF THE FOLLOWING:

   • GREASE DUCTS SHALL NOT HAVE OPENINGS EXCEPT WHERE REQUIRED FOR THE OPERATION AND MAINTENANCE OF THE SYSTEM.
   • SECTIONS OF GREASE DUCTS THAT ARE INACCESSIBLE FROM THE HOOD OR DISCHARGE OPENINGS SHALL BE PROVIDED WITH CLEANOUT OPENINGS SPACED NOT MORE THAN 20 FEET (6096 MM) APART AND NOT MORE THAN 10 FEET (3048 MM) FROM CHANGES IN DIRECTION GREATER THAN 45 DEGREES (0.79 RAD).
   • CLEANOUTS AND OPENINGS SHALL BE EQUIPPED WITH TIGHT-FITTING DOORS CONSTRUCTED OF STEEL HAVING A THICKNESS NOT LESS THAN THAT REQUIRED FOR THE DUCT.
   • CLEANOUT DOORS SHALL BE INSTALLED LIQUID TIGHT.
   • DOOR ASSEMBLIES INCLUDING ANY FRAMES AND GASKETS SHALL BE APPROVED FOR THE APPLICATION AND SHALL NOT HAVE FASTENERS THAT PENETRATE THE DUCT.
   • GASKET AND SEALING MATERIALS SHALL BE RATED FOR NOT LESS THAN 1500ºF (816ºC).
   • LISTED DOOR ASSEMBLIES SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER’S INSTRUCTIONS.

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 22 INCHES BY 20 INCHES (559 MM BY 508 MM) 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.
506.3.9 GREASE DUCT HORIZONTAL CLEANOUTS.

- CLEANOUTS SERVING HORIZONTAL SECTIONS OF GREASE DUCTS SHALL:
  1. BE SPACED NOT MORE THAN 20 FEET (6096 MM) APART.
  2. BE LOCATED NOT MORE THAN 10 FEET (3048 MM) FROM CHANGES IN DIRECTION THAT ARE GREATER THAN 45 DEGREES (0.79 RAD).
  3. BE LOCATED ON THE BOTTOM ONLY WHERE OTHER LOCATIONS ARE NOT AVAILABLE AND SHALL BE PROVIDED WITH INTERNAL DAMMING OF THE OPENING SUCH THAT GREASE WILL FLOW PAST THE OPENING WITHOUT POOLING. BOTTOM CLEANOUTS AND OPENINGS SHALL BE APPROVED FOR THE APPLICATION AND INSTALLED LIQUID-TIGHT.
  4. NOT BE CLOSER THAN 1 INCH (25 MM) FROM THE EDGES OF THE DUCT.
  5. HAVE OPENING DIMENSIONS OF NOT LESS THAN 12 INCHES BY 12 INCHES (305 MM BY 305 MM). WHERE SUCH DIMENSIONS PRECLUDE INSTALLATION, THE OPENING SHALL BE NOT LESS THAN 12 INCHES (305 MM) ON ONE SIDE AND SHALL BE LARGE ENOUGH TO PROVIDE ACCESS FOR EXHAUST AND VAPOR REMOVAL.
  6. SHALL BE LOCATED AT GREASE RESERVOIRS.

506.3.11 GREASE DUCT ENCLOSURES.

- A COMMERCIAL KITCHEN GREASE DUCT SERVING A TYPE I HOOD THAT PENETRATES A CEILING, WALL, FLOOR OR ANY CONCEALED SPACE SHALL BE ENCLOSED FROM THE POINT OF PENETRATION TO THE OUTLET TERMINAL. IN-LINE EXHAUST FANS NOT LOCATED IN OR ABOVE THE HOOD OR CONVEY OR CHUTE DUCTS SHALL NOT BE ENCLOSED. DUCT ENCLOSURES SHALL BE ENCLOSED AS REQUIRED FOR GREASE DUCTS. A DUCT SHALL BE CONSIDERED PART OF THE CONSTRUCTION IN WHICH IT PENETRATES WHERE THE EXING CONSTRUCTION IS NOT REQUIRED FOR THE INTERNATIONAL BUILDING CODE. THE DUCT ENCLOSURE SHALL SERVE A SINGLE GREASE DUCT AND SHALL NOT CONTAIN OTHER DUCTS, CONDUIT, OR PIPE SYSTEMS. DUCT ENCLOSURES SHALL BE A SHAFT ENCLOSURE IN ACCORDANCE WITH SECTION 506.3.11.1, A FIELD-APPLIED ENCLOSURE ASSEMBLY IN ACCORDANCE WITH SECTION 506.3.11.2 OR A FACTORY-BUILT ENCLOSURE ASSEMBLY IN ACCORDANCE WITH SECTION 506.3.11.3. DUCT ENCLOSURES SHALL HAVE A FIRE-RESISTANCE RATING OF NOT LESS THAN THAT OF THE ASSEMBLY PENETRATED AND NOT LESS THAN 1 HOUR. FIRE DAMPERS AND SMOKE DAMPERS SHALL NOT BE INSTALLED IN GREASE DUCTS.

EXCEPTION: A DUCT ENCLOSURE SHALL NOT BE REQUIRED FOR A GREASE DUCT THAT PENETRATES ONLY A NON-FIRE-RESISTANCE-RATED ROOF/CEILING ASSEMBLY.
506.3.11.2 FIELD-APPLIED GREASE DUCT ENCLOSURE.

Grease ducts constructed in accordance with Section 506.3 shall be enclosed by a listed and labeled field-applied grease duct enclosure material, system, product, or method of construction specifically evaluated for such purpose in accordance with ASTM E2336. The surface of the duct shall be continuously covered on all sides from the point at which the duct originates to the outlet terminal. Duct penetrations shall be protected with a through-penetration firestop system tested and listed in accordance with ASTM E814 or UL 1479 and having a "F" and "T" rating equal to the fire-resistance rating of the assembly being penetrated. The grease duct enclosure and firestop system shall be installed in accordance with the listing and the manufacturer's instructions. Initial application of a field-applied grease duct enclosure shall not be installed for the sole purpose of reducing clearances to combustibles at isolated sections of grease duct. Exposed duct wrap systems shall be protected where subject to physical damage.

F AND T RATINGS

- **[F] F RATING.** The time period that the through-penetration firestop system limits the spread of fire through the penetration when tested in accordance with ASTM E814 or UL 1479.
- **[T] T RATING.** The time period that the penetration firestop system, including the penetrating item, limits the maximum temperature rise to 325°F (163°C) above its initial temperature through the penetration on the non-fire side when tested in accordance with ASTM E814 or UL 1479.
- Definition is not in the 2018 IFC.
DUCT WRAP AND F & T FIRESTOP

506.3.11.3 FACTORY-BUILT GREASE DUCT ENCLOSURE ASSEMBLIES.

• Factory-built grease ducts incorporating integral enclosure materials shall be listed and labeled for use as grease duct enclosure assemblies specifically evaluated for such purpose in accordance with UL 222. Duct penetrations shall be protected with a through-penetration firestop system tested and listed in accordance with ASTM E119 or UL 2079 and having an "F" and "T" rating equal to the fire-resistance rating of the assembly being penetrated. The grease duct enclosure assembly and firestop system shall be installed in accordance with the listing and the manufacturer's instructions.

506.3.12 GREASE DUCT FIRE-RESISTIVE ACCESS OPENING.

• Where cleanout openings are located in ducts within a fire-resistance-rated enclosure, access openings shall be provided in the enclosure at each cleanout point. Access openings shall be equipped with tight-fitting sliding or hinged doors that are equal in fire-resistant protection to that of the shaft or enclosure. An approved sign shall be placed on access opening panels with wording as follows: "ACCESS PANEL DO NOT OBSTRUCT."
506.3.13.1 TERMINATION ABOVE THE ROOF.

- Exhaust outlets that terminate above the roof shall have the discharge opening located not less than 40 inches (1016 mm) above the roof surface.

506.3.13.2 TERMINATION THROUGH AN EXTERIOR WALL.

- Exhaust outlets shall be permitted to terminate through exterior walls where the smoke, grease, gases, vapors and odors in the discharge from such terminations do not create a public nuisance or a fire hazard. Such terminations shall not be located where protected openings are required by the International Building Code. Such terminations shall be located in accordance with Section 506.3.13.3 and shall not be located within 3 feet (914 mm) of any opening in the exterior wall.

506.3.13.3 TERMINATION LOCATION.

- Exhaust outlets shall be located not less than 10 feet (3048 mm) horizontally from parts of the same or contiguous buildings, adjacent buildings and adjacent property lines and shall be located not less than 10 feet (3048 mm) above the adjoining grade level. Exhaust outlets shall be located not less than 10 feet (3048 mm) horizontally from or not less than 3 feet (914 mm) above air intake openings into any building.

Exception: Exhaust outlets shall terminate not less than 10 feet (3048 mm) horizontally from parts of the same or contiguous building, an adjacent building, adjacent property line and air intake openings into a building where air from the exhaust outlet discharges away from such locations.
WALL TERMINATIONS – NFPA 96

- NON-COMBUSTIBLE WALLS ONLY
- 10 FEET FROM GRADE
- WHAT ABOUT ZERO PROPERTY LINES?
- WHAT PREVAILS – NFPA 96 OR THE IMC

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COMMERCIAL KITCHEN EXHAUST HOODS SHALL COMPLY WITH THE REQUIREMENTS OF THIS SECTION. HOODS SHALL BE TYPE I OR II AND SHALL BE DESIGNED TO CAPTURE AND CONFINE COOKING VAPORS AND RESIDUES. A TYPE I OR TYPE II HOOD SHALL BE INSTALLED AT OR ABOVE APPLIANCES IN ACCORDANCE WITH SECTIONS 507.2 AND 507.3. WHERE ANY COOKING APPLIANCE UNDER A SINGLE HOOD REQUIRES A TYPE I HOOD, A TYPE I HOOD SHALL BE INSTALLED. WHERE A TYPE II HOOD IS REQUIRED, A TYPE II HOOD SHALL BE INSTALLED. WHERE A TYPE I HOOD IS INSTALLED, THE INSTALLATION OF THE ENTIRE SYSTEM, INCLUDING THE HOOD, DUCTS, EXHAUST EQUIPMENT AND MAKEUP AIR SYSTEM SHALL COMPLY WITH THE REQUIREMENTS OF SECTIONS 507, 508, 509 AND 509.
HOODS

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

• TYPE I. A kitchen hood for collecting and removing grease vapors and smoke. Such hoods are equipped with a fire suppression system.

• TYPE II. A general kitchen hood for collecting and removing steam, vapor, heat, odors and products of combustion.

507.1.1 OPERATION

• COMMERCIAL KITCHEN EXHAUST HOOD SYSTEMS SHALL OPERATE DURING THE COOKING OPERATION. THE HOOD EXHAUST RATE SHALL COMPLY WITH THE LISTING OF THE HOOD OR SHALL COMPLY WITH SECTION 307.2. THE EXHAUST FAN SERVING A TYPE I HOOD SHALL HAVE AUTOMATIC CONTROLS THAT WILL ACTIVATE THE FAN WHEN ANY APPLIANCE THAT REQUIRES SUCH TYPE I HOOD IS TURNED ON. A MEANS OF INTERLOCK SHALL BE PROVIDED THAT WILL PREVENT OPERATION OF SUCH APPLIANCES WHEN THE EXHAUST FAN IS NOT TURNED ON. WHERE ONE OR MORE TEMPERATURE OR RADIANT ENERGY SENSORS ARE USED TO ACTIVATE A TYPE I HOOD EXHAUST FAN, THE FAN SHALL ACTIVATE NOT MORE THAN 15 MINUTES AFTER THE FIRST APPLIANCE SERVED BY THAT HOOD HAS BEEN TURNED ON. A METHOD OF INTERLOCK BETWEEN AN EXHAUST HOOD SYSTEM AND APPLIANCES EQUIPPED WITH STANDING PILOT BURNERS SHALL NOT CAUSE THE PILOT BURNERS TO BE EXTINGUISHED. A METHOD OF INTERLOCK BETWEEN AN EXHAUST HOOD SYSTEM AND COOKING APPLIANCES SHALL NOT INVOLVE OR DEPEND ON ANY COMPONENT OF A FIRE-EXTINGUISHING SYSTEM.

CONTINUED

• THE NET EXHAUST VOLUMES FOR HOODS SHALL BE PERMITTED TO BE REDUCED DURING PART-LOAD COOKING CONDITIONS, WHERE ENGINEERED OR LISTED MULTISPEED OR VARIABLE SPEED CONTROLS AUTOMATICALLY OPERATE THE EXHAUST SYSTEM TO MAINTAIN CAPTURE AND REMOVAL OF COOKING EFFLUENTS AS REQUIRED BY THIS SECTION. REDUCED VOLUMES SHALL NOT BE BELOW THAT REQUIRED TO MAINTAIN CAPTURE AND REMOVAL OF EFFLUENTS FROM THE IDLE COOKING APPLIANCES THAT ARE OPERATING IN A STANDBY MODE.
507.1.5 EXHAUST OUTLETS

- Exhaust outlets located within the hood shall be located so as to optimize the capture of particulate matter. Each outlet shall serve not more than a 1.2-foot (365.8 mm) section of hood.

507.2 TYPE I HOODS

- Type I hoods shall be installed where cooking appliances produce grease or smoke as a result of the cooking process. Type I hoods shall be installed over medium-duty, heavy-duty, and extra-heavy-duty cooking appliances.

  Exception: A Type I hood shall not be required for an electric cooking appliance where an approved testing agency provides documentation that the appliance exhaust contains 5 mg/m³ or less of grease when tested at an exhaust flow rate of 500 CFM (0.236 m³/s) in accordance with UL 710B.

507.2.1 TYPE I EXHAUST FLOW RATE LABEL

- Type I hoods shall bear a label indicating the minimum exhaust flow rate in CFM per linear foot (1.55 L/s per linear meter) of hood that provides for capture and containment of the exhaust effluent for the cooking appliances served by the hood, based on the cooking appliance duty classifications defined in this code.
507.2.2 TYPE I EXTRA-HEAVY-DUTY

- Type I hoods for use over extra-heavy-duty cooking appliances shall not cover heavy-, medium-, or light-duty appliances. Type I hoods shall be connected to an exhaust system that is independent of other exhaust systems.

- What constitutes an extra-heavy-duty cooking appliance?

- Extra-heavy-duty cooking appliances are those utilizing open flame combustion of solid fuel at any time.

- What about wood-fired pizza ovens?

- Heavy-duty cooking appliances include electric under-fired broilers, electric chain (conveyor) broilers, gas under-fired broilers, gas chain (conveyor) broilers, gas open-burner ranges (with or without oven), electric and gas wok ranges, smokers, smoker ovens, and electric and gas over-fired (upright) broilers and salamanders.

Medium-duty cooking appliances include electric discrete element ranges (with or without oven), electric and gas hot-top ranges, electric and gas griddles, electric and gas double-sided griddles, electric and gas fryers (including open, deep fat, doughnut fryers, kettle fryers and pressure fryers), electric and gas conveyor pizza ovens, electric and gas tilting skillets (bracing pans) and electric and gas rotisseries.
LIGHT-DUTY COOKING APPLIANCE

- LIGHT-DUTY COOKING APPLIANCES INCLUDE GAS AND ELECTRIC OVENS (INCLUDING STANDARD, BAKE, ROASTING, REVOLVING, RETHERM, CONVECTION, COMBINATION CONVECTION/STEAMER, COUNTERTOP CONVECTIONIZED BAKING/FINISHING, DECK AND PASTRY), ELECTRIC AND GAS STEAM-JACKETED KETTLES, ELECTRIC AND GAS PASTA COOKERS, ELECTRIC AND GAS COMPARTMENT STEAMERS (BOTH PRESSURE AND ATMOSPHERIC) AND ELECTRIC AND GAS CHEESE Melters.

507.2.3 TYPE I MATERIALS

- TYPE I HOODS SHALL BE CONSTRUCTED OF STEEL HAVING A MINIMUM THICKNESS OF NO. 18 GAUGE OR STAINLESS STEEL NOT LESS THAN NO. 20 GAUGE IN THICKNESS.

507.2.5 TYPE I HOODS

- EXTERNAL HOOD JOINTS, SEAMS AND PENETRATIONS FOR TYPE I HOODS SHALL BE MADE WITH A CONTINUOUS EXTERNAL LIQUID-TIGHT WELD OR BRAZE TO THE LOWEST OUTERMOST PERIMETER OF THE HOOD. INTERNAL HOOD JOINTS, SEAMS, PENETRATIONS, FILTER SUPPORT FRAMES AND OTHER APPENDAGES ATTACHED INSIDE THE HOOD SHALL NOT BE REQUIRED TO BE WELDED OR BRAZED BUT SHALL BE OTHERWISE SEALED TO BE GREASE TIGHT.

EXCEPTIONS:

1. PENETRATIONS SHALL NOT BE REQUIRED TO BE WELDED OR BRAZED WHERE SEALED BY DEVICES THAT ARE LISTED FOR THE APPLICATION.

2. INTERNAL WELDING OR BRAZING OF SEAMS, JOINTS AND PENETRATIONS OF THE HOOD SHALL NOT BE PROHIBITED PROVIDED THAT THE JOINT IS FORMED SMOOTH OR GROUND SO AS TO NOT TRAP GREASE, AND IS READILY CLEANABLE.
507.2.6 CLEARANCES FOR TYPE I HOOD

• A TYPE I HOOD SHALL BE INSTALLED WITH A CLEARANCE TO COMBUSTIBLES OF NOT LESS THAN 18 INCHES (457 MM).

• EXCEPTIONS:
  1. CLEARANCE SHALL NOT BE REQUIRED FROM GYPSUM WALLBOARD OR 5/8-INCH (12.7 MM) OR THICKER CEMENTITIOUS WALLBOARD ATTACHED TO NONCOMBUSTIBLE STRUCTURES PROVIDED THAT A SMOOTH, CLEANABLE, NONABSORBENT AND NONCOMBUSTIBLE MATERIAL IS INSTALLED BETWEEN THE HOOD AND THE GYPSUM OR CEMENTITIOUS WALLBOARD OVER AN AREA EXTENDING NOT LESS THAN 18 INCHES (457 MM) IN ALL DIRECTIONS FROM THE HOOD.
  2. TYPE I HOODS LISTED AND LABELED FOR CLEARANCES LESS THAN 18 INCHES IN ACCORDANCE WITH UL 710 SHALL BE INSTALLED WITH THE CLEARANCES SPECIFIED BY SUCH LISTINGS.

507.2.8 TYPE I GREASE FILTERS

• TYPE I HOODS SHALL BE EQUIPPED WITH GREASE FILTERS LISTED AND LABELED IN ACCORDANCE WITH UL 1046. GREASE FILTERS SHALL BE PROVIDED WITH ACCESS FOR CLEANING OR REPLACEMENT. THE LOWEST EDGE OF A GREASE FILTER LOCATED ABOVE THE COOKING SURFACE SHALL BE NOT LESS THAN THE HEIGHT SPECIFIED IN TABLE 507.2.8.

• FILTERS SHALL BE INSTALLED AT AN ANGLE OF NOT LESS THAN 45 DEGREES (0.79 RADS) FROM THE HORIZONTAL AND SHALL BE EQUIPPED WITH A DRIP TRAY BENEATH THE LOWER EDGE OF THE FILTERS.

• 507.2.9 GREASE GUTTERS FOR TYPE I HOOD.
• GREASE GUTTERS SHALL DRAIN TO AN APPROVED COLLECTION RECEPTACLE THAT IS FABRICATED, DESIGNED AND INSTALLED TO ALLOW ACCESS FOR CLEANING.
507.4.1 CANOPY SIZE AND LOCATION

- The inside lower edge of canopy-type Type I and II commercial hoods shall overhang or extend a horizontal distance of not less than 6 inches (152 mm) beyond the edge of the top horizontal surface of the appliance on all open sides. The vertical distance between the front lower lip of the hood and such surface shall not exceed 4 feet (1219 mm).

- Exception: The hood shall be permitted to be flush with the outer edge of the cooking surface where the hood is closed to the appliance side by a noncombustible wall or panel.

507.4.2 NON-CANOPY SIZE AND LOCATION

- Non-canyon type hoods shall be located not greater than 3 feet (914 mm) above the cooking surface. The edge of the hood shall be set back not greater than 1 foot (305 mm) from the edge of the cooking surface.

507.5 CAPACITY OF HOODS

- Commercial food service hoods shall exhaust a minimum net quantity of air determined in accordance with this section and Sections 507.5.1 through 507.5.4. The net quantity of exhaust air shall be calculated by subtracting any airflow supplied directly to a hood cavity from the total exhaust flow rate of a hood. Where any combination of heavy-duty, medium-duty, and light-duty cooking appliances are utilized under a single hood, the exhaust rate required by this section for the heaviest duty appliance covered by the hood shall be used for the entire hood.
**507.5.3 MEDIUM-DUTY COOKING APPLIANCES.**

<table>
<thead>
<tr>
<th>Type of hood</th>
<th>Exhaust rate (cups/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall mounted canopy</td>
<td>300</td>
</tr>
<tr>
<td>Hooded range canopy</td>
<td>250</td>
</tr>
<tr>
<td>Island canopy</td>
<td>200</td>
</tr>
</tbody>
</table>

- **EXAMPLE**
  - Wall mounted canopy hood
  - Hooded duty cooking appliances
  - 10' x 300 = 3,000 CFM required
  - Heavy-duty cooking appliances
  - 10' x 400 = 4,000 CFM required
  - Worst case scenario applies
  - Gas-fired broilers are considered heavy-duty appliances so 400 CFM!

**507.6 PERFORMANCE TEST.**

- A performance test shall be conducted upon completion and before final approval of the installation of a ventilation system serving commercial cooking appliances. The test shall verify the rate of exhaust airflow required by section 507.5, makeup airflow required by section 508, and proper operation as specified in this chapter. The permit holder shall furnish the necessary test equipment and devices required to perform the tests.
507.6.1 CAPTURE AND CONTAINMENT TEST.

• The permit holder shall verify capture and containment performance of the exhaust system. This field test shall be conducted with all appliances under the hood at operating temperatures, with all sources of outdoor air providing makeup air for the hood operating and with all sources of recirculated air providing conditioning for the space in which the hood is located operating. Capture and containment shall be verified visually by observing smoke or steam produced by actual or simulated cooking, such as that provided by smoke candles and smoke puffers. Smoke bombs shall not be used.

SECTION 508
COMMERCIAL KITCHEN MAKEUP AIR

• Makeup air shall be supplied during the operation of commercial kitchen exhaust systems that are provided for commercial cooking appliances. The amount of makeup air supplied to the building from all sources shall be approximately equal to the amount of exhaust air for all exhaust systems for the building. The makeup air shall not reduce the effectiveness of the exhaust system. Makeup air shall be provided by gravity or mechanical means or both. Mechanical makeup air systems shall be automatically controlled to start and operate simultaneously with the exhaust system. Makeup air intake openings locations shall comply with Section 401.4.
508.1.1 MAKEUP AIR TEMPERATURE.

• The temperature differential between makeup air and the air in the conditioned space shall not exceed 10°F (6°C) except where the added heating and cooling loads of the makeup air do not exceed the capacity of the HVAC system.

508.1.2 AIR BALANCE.

• Design plans for a facility with a commercial kitchen ventilation system shall include a schedule or diagram indicating the design outdoor air balance. The design outdoor air balance shall indicate all exhaust and replacement air for the facility, plus the net exfiltration if applicable. The total replacement air airflow rate shall equal the total exhaust airflow rate plus the net exfiltration.

508.2 COMPENSATING HOODS.

• Manufacturers of compensating hoods shall provide a label indicating the minimum exhaust flow, the maximum makeup airflow or both that provides capture and containment of the exhaust effluent.

• Exception: Compensating hoods with makeup air supplied only from the front face discharge and side face discharge openings shall not be required to be labeled with the maximum makeup airflow.
SECTION 509
FIRE SUPPRESSION SYSTEMS

509.1 WHERE REQUIRED.

COOKING APPLIANCES REQUIRED BY SECTION 507.2 TO HAVE A TYPE I HOOD SHALL BE PROVIDED WITH AN APPROVED AUTOMATIC FIRE SUPPRESSION SYSTEM COMPLYING WITH THE INTERNATIONAL BUILDING CODE AND THE INTERNATIONAL FIRE CODE.

AGAIN – THE IBC, IPC, IMC AND THE IFGC

WHAT TYPE OF APPLIANCE?

FRYER = MEDIUM DUTY APPLIANCE
GRIDDLE = MEDIUM DUTY APPLIANCE
BURNER = MEDIUM DUTY APPLIANCE
GAS GRILL = HEAVY DUTY APPLIANCE

SECTION 917 COOKING APPLIANCES

917.1 COOKING APPLIANCES.

COOKING APPLIANCES THAT ARE DESIGNED FOR PERMANENT INSTALLATION, INCLUDING RANGES, OVENS, STOVES, BROILERS, GRILLS, FRYERS, GRIDDLES AND BARBECUES, SHALL BE LISTED, LABELED AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER’S INSTRUCTIONS.

COMMERCIAL ELECTRIC COOKING APPLIANCES SHALL BE LISTED AND LABELED IN ACCORDANCE WITH UL 197. HOUSEHOLD ELECTRIC RANGES SHALL BE LISTED AND LABELED IN ACCORDANCE WITH UL 858. MICROWAVE COOKING APPLIANCES SHALL BE LISTED AND LABELED IN ACCORDANCE WITH UL 923. OIL-BURNING STOVES SHALL BE LISTED AND LABELED IN ACCORDANCE WITH UL 922. SOLID-FUEL-FIRED OVENS SHALL BE LISTED AND LABELED IN ACCORDANCE WITH UL 2162.
THE FIRE & BUILDING CODES – 2018 IFC & IBC

• IF 903.3.11.5 COMMERCIAL COOKING OPERATIONS.
• AN AUTOMATIC SPRINKLER SYSTEM SHALL BE INSTALLED IN COMMERCIAL KITCHEN EXHAUST HOOD AND DUCT SYSTEMS WHERE AN AUTOMATIC SPRINKLER SYSTEM IS USED TO COMPLY WITH SECTION 904.
• WHAT DOES THIS SECTION SAY......MEAN?
• SECTION 904 ALTERNATIVE AUTOMATIC FIRE-EXTINGUISHING SYSTEMS

SECTION 904
ALTERNATIVE AUTOMATIC FIRE-EXTINGUISHING SYSTEMS

• [F] 904.1 GENERAL.
• AUTOMATIC FIRE-EXTINGUISHING SYSTEMS, OTHER THAN AUTOMATIC SPRINKLER SYSTEMS, SHALL BE DESIGNED, INSTALLED, INSPECTED, TESTED AND MAINTAINED IN ACCORDANCE WITH THE PROVISIONS OF THIS SECTION AND THE APPLICABLE REFERENCED STANDARDS.

[F] 904.2 WHERE PERMITTED

• AUTOMATIC FIRE-EXTINGUISHING SYSTEMS INSTALLED AS AN ALTERNATIVE TO THE REQUIRED AUTOMATIC SPRINKLER SYSTEMS OF SECTION 902 SHALL BE APPROVED BY THE FIRE CODE OFFICIAL.
[F] 904.2.2 COMMERCIAL HOOD AND DUCT SYSTEMS.

• Each required commercial kitchen exhaust hood and duct system required by Section 609 of the International Fire Code or Chapter 5 of the International Mechanical Code to have a Type I hood shall be protected with an approved automatic fire-extinguishing system installed in accordance with this Code.

[F] 904.3.2 ACTUATION.

• Automatic fire-extinguishing systems shall be automatically actuated and provided with a manual means of actuation in accordance with Section 904.12.1. Where more than one hazard could be simultaneously involved in fire due to their proximity, all hazards shall be protected by a single system designed to protect all hazards that could become involved.

• Not more than 48-inches above the floor or less than 42-inches.
904.3.3 SYSTEM INTERLOCKING

- Automatic equipment interlocks with fuel shut-offs, ventilation controls, door closers, window shutters, conveyor openings, smoke and heat vents and other features necessary for proper operation of the fire-extinguishing system shall be provided as required by the design and installation standard utilized for the hazard.

904.3.5 MONITORING

- Where a building fire alarm system is installed, automatic fire-extinguishing systems shall be monitored by the building fire alarm system in accordance with NFPA 72.

904.4 INSPECTION AND TESTING

- Automatic fire-extinguishing systems shall be inspected and tested in accordance with the provisions of this section prior to acceptance.

  904.4.1 INSPECTION.
  - Prior to conducting final acceptance tests, all of the following items shall be inspected:
    - 1. Hazard specification for consistency with design hazard.
    - 2. Type, location and spacing of automatic and manual initiating devices.
    - 3. Size, placement and position of nozzles or discharge orifices.
    - 4. Location and identification of alarms and visual alarm devices.
    - 5. Identification of devices with proper designations.
    - 6. Operating instructions.
**[F] 904.5 WET-CHEMICAL SYSTEMS**

- Wet-chemical extinguishing systems shall be installed, maintained, periodically inspected and tested in accordance with NFPA 17A and their listing. Records of inspections and testing shall be maintained.

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**[F] 904.12 COMMERCIAL COOKING SYSTEMS**

- The automatic fire-extinguishing system for commercial cooking systems shall be of a type recognized for protection of commercial cooking equipment and exhaust systems of the type and arrangement protected. Pre-engineered automatic dry- and wet-chemical extinguishing systems shall be tested in accordance with UL and listed and labeled for the intended application. Other types of automatic fire-extinguishing systems shall be listed and labeled for specific use as protection for commercial cooking operations. The system shall be installed in accordance with this code, NFPA 96, its listing and the manufacturer’s installation instructions. Automatic fire-extinguishing systems of the following types shall be installed in accordance with the referenced standard indicated, as follows:

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**2018 IFC CHANGE**

- 904.12 COMMERCIAL COOKING OPERATIONS
  - Water mist systems are added to the list of fire-extinguishing systems applicable for protection of commercial cooking systems. Several systems have been tested and approved for protection of industrial cooking systems. NFPA 96 includes water mist extinguishing systems as an acceptable fire-extinguishing system for commercial cooking.
ALTERNATE SYSTEMS INSTALLED PER THEIR STANDARD

- 1. CARBON DIOXIDE EXTINGUISHING SYSTEMS, NFPA 12
- 2. AUTOMATIC SPRINKLER SYSTEMS, NFPA 13
- 3. AUTOMATIC WATER MIST SYSTEMS, NFPA 750
- 4. FOAM-WATER SPRINKLER SYSTEM OR FOAM-WATER SPRAY SYSTEMS, NFPA 16
- 5. DRY-CHEMICAL EXTINGUISHING SYSTEMS, NFPA 17
- 6. WET-CHEMICAL EXTINGUISHING SYSTEMS, NFPA 17A

EXCEPTION: FACTORY-BUILT COMMERCIAL COOKING RECYCLING SYSTEMS THAT ARE TESTED IN ACCORDANCE WITH UL 710B AND LISTED, LABELED AND INSTALLED IN ACCORDANCE WITH SECTION 304.1 OF THE INTERNATIONAL MECHANICAL CODE.

[F] 904.12.1 MANUAL SYSTEM OPERATION

- A MANUAL ACTUATION DEVICE SHALL BE LOCATED AT OR NEAR A MEANS OF EGRESS FROM THE COOKING AREA NOT LESS THAN 10 FEET (3048 MM) AND NOT MORE THAN 20 FEET (6096 MM) FROM THE KITCHEN EXHAUST SYSTEM. THE MANUAL ACTUATION DEVICE SHALL BE INSTALLED NOT MORE THAN 48 INCHES (1200 MM) OR LESS THAN 42 INCHES (1067 MM) ABOVE THE FLOOR AND SHALL CLEARLY IDENTIFY THE HAZARD PROTECTED. THE MANUAL ACTUATION SHALL REQUIRE A MAXIMUM FORCE OF 40 POUNDS (178 N) AND A MAXIMUM MOVEMENT OF 14 INCHES (356 MM) TO ACTUATE THE FIRE SUPPRESSION SYSTEM.

EXCEPTION: AUTOMATIC SPRINKLER SYSTEMS SHALL NOT BE REQUIRED TO BE EQUIPPED WITH MANUAL ACTUATION MEANS.

ANY ISSUES?
[F] 904.12.2 SYSTEM INTERCONNECTION

- The actuation of the fire suppression system shall automatically shut down the fuel or electrical power supply to the cooking equipment. The fuel and electrical supply reset shall be manual.

[F] 904.12.3.1 VENTILATION SYSTEM.

- Commercial-type cooking equipment protected by an automatic carbon dioxide-extinguishing system shall be arranged to shut off the ventilation system upon activation.

[F] 904.12.4 SPECIAL PROVISIONS FOR AUTOMATIC SPRINKLER SYSTEMS.

- Automatic sprinkler systems protecting commercial-type cooking equipment shall be supplied from a separate, indicating-type control valve that is identified. Access to the control valve shall be provided.

[F] 904.12.4.1 LISTED SPRINKLERS

- Sprinklers used for the protection of fryers shall be tested in accordance with UL 199, listed for that application and installed in accordance with their listing.
SECTION 607 COMMERCIAL KITCHEN HOODS

[M] 607.1 GENERAL.

COMMERCIAL KITCHEN EXHAUST HOODS SHALL COMPLY WITH THE REQUIREMENTS OF THE INTERNATIONAL MECHANICAL CODE.

[M] 607.2 WHERE REQUIRED

A TYPE I HOOD SHALL BE INSTALLED AT OR ABOVE ALL COMMERCIAL COOKING APPLIANCES AND DOMESTIC COOKING APPLIANCES USED FOR COMMERCIAL PURPOSES THAT PRODUCE GREASE VAPORS.

EXCEPTIONS:

FOUR EXCEPTIONS TO THIS!

607.3.1 VENTILATION SYSTEM

THE VENTILATION SYSTEM IN CONNECTION WITH HOODS SHALL BE OPERATED AT THE REQUIRED RATE OF AIR MOVEMENT, AND GREASE FILTERS LISTED AND LABELED IN ACCORDANCE WITH UL 1046 SHALL BE IN PLACE WHERE EQUIPMENT UNDER A KITCHEN GREASE HOOD IS USED.
607.3.2 GREASE EXTRACTORS

- Where grease extractors are installed, they shall be operated when the commercial-type cooking equipment is used.

607.3.3 CLEANING.

- Hoods, grease-removal devices, fans, ducts and other appurtenances shall be cleaned at intervals as required by Sections 607.3.3.1 through 607.3.3.3.

607.3.3.1 INSPECTION

- Hoods, grease-removal devices, fans, ducts and other appurtenances shall be inspected at intervals specified in Table 607.3.3.1 or as approved by the fire code official. Inspections shall be completed by qualified individuals.

607.3.3.3 RECORDS

- Records for inspections shall state the individual and company performing the inspection, a description of the inspection and when the inspection took place. Records for cleanings shall state the individual and company performing the cleaning and when the cleaning took place. Such records shall be completed after each inspection or cleaning and maintained.
607.3.3.1 TAGS

• WHEN A COMMERCIAL KITCHEN HOOD OR DUCT SYSTEM IS INSPECTED, A TAG CONTAINING
  THE SERVICE PROVIDER NAME, ADDRESS, TELEPHONE NUMBER AND DATE OF SERVICE SHALL BE
  PROVIDED IN A CONSPICUOUS LOCATION. PRIOR TAGS SHALL BE COVERED OR REMOVED.

607.3.4 EXTINGUISHING SYSTEM SERVICE

• AUTOMATIC FIRE-EXTINGUISHING SYSTEMS PROTECTING COMMERCIAL COOKING SYSTEMS
  SHALL BE SERVICED AS REQUIRED IN SECTION 904.12.5.
• 904.12.5.1 EXISTING AUTOMATIC FIRE-EXTINGUISHING SYSTEMS.
  WHERE CHANGES IN THE COOKING MEDIA, POSITIONING OF COOKING EQUIPMENT OR
  REPLACEMENT OF COOKING EQUIPMENT OCCUR IN EXISTING COMMERCIAL COOKING
  SYSTEMS, THE AUTOMATIC FIRE-EXTINGUISHING SYSTEM SHALL BE REQUIRED TO COMPLY
  WITH THE APPLICABLE PROVISIONS OF SECTIONS 904.12 THROUGH 904.12.4.

CONTINUED

• 904.12.3 FUSIBLE LINK AND SPRINKLER HEAD REPLACEMENT.
  • FUSIBLE LINKS AND AUTOMATIC SPRINKLER HEADS SHALL BE REPLACED ANNUALLY, AND OTHER
    PROTECTION DEVICES SHALL BE SERVICED OR REPLACED IN ACCORDANCE WITH THE
    MANUFACTURER’S INSTRUCTIONS.
  • EXCEPTION: FRANGIBLE BULBS ARE NOT REQUIRED TO BE REPLACED ANNUALLY.
607.4 APPLIANCE CONNECTION TO BUILDING PIPING

• Gas-fired commercial cooking appliances installed on casters and appliances that are moved for cleaning and sanitation purposes shall be connected to the piping system with an appliance connector listed as complying with ANSI Z21.69. The commercial cooking appliance connector installation shall be configured in accordance with the manufacturer's installation instructions. Movement of appliances with casters shall be limited by a restraining device installed in accordance with the connector and appliance manufacturer's instructions.

FUEL-GAS CODE

• 411.1.1 COMMERCIAL COOKING APPLIANCES.

• Commercial cooking appliances installed on casters and appliances that are moved for cleaning and sanitation purposes shall be connected to the piping system with an appliance connector listed as complying with ANSI Z21.69. The commercial cooking appliance connector installation shall be configured in accordance with the manufacturer's instructions. Movement of appliances with casters shall be limited by a restraining device installed in accordance with the connector and appliance manufacturer's instructions.

• 411.1.3 MAXIMUM LENGTH.

• Connectors shall have an overall length not to exceed 6 feet (1829 mm). Measurement shall be made along the centerline of the connector. Only one connector shall be used for each appliance.

SECTION 608 COMMERCIAL KITCHEN COOKING OIL STORAGE

• 608.1 GENERAL.

• Storage of cooking oil (grease) in commercial cooking operations utilizing above-ground tanks with a capacity greater than 60 gal (227 l) installed within a building shall comply with sections 610.2 through 610.7 and NFPA 30. For purposes of this section, cooking oil shall be classified as a class IIb liquid unless otherwise determined by testing.

• Actual sections are 608.2 through 608.7
COOKING OIL STORAGE TANKS

608.3

Nonmetallic cooking oil storage tanks shall be listed in accordance with UL 2152 and shall be installed in accordance with the tank manufacturer’s instructions.

Tank capacity shall not exceed 200 gallons per tank.

- Typically, two tanks are installed for cooking oil storage: one for fresh oil, and one for waste oil.

NFPA 17A

- Wet Chemical Extinguishing Systems 2017 Edition
- Chapter 1 Administration
- Chapter 2 Referenced Publications
- Chapter 3 Definitions
- Chapter 4 Components
- Chapter 5 System Requirements
- Chapter 6 Plans and Acceptance Tests
- Chapter 7 Inspection, Testing, and Recharging
CHAPTER 1 ADMINISTRATION

1.2 PURPOSE. THIS STANDARD IS PREPARED FOR THE USE AND GUIDANCE OF THOSE CHARGED WITH THE PURCHASING, DESIGNING, INSTALLATION, TESTING, INSPECTING, APPROVING, LISTING, OPERATING, OR MAINTAINING OF PRE-ENGINEERED WET CHEMICAL FIRE-EXTINGUISHING SYSTEMS IN ORDER THAT SUCH EQUIPMENT WILL FUNCTION AS INTENDED THROUGHOUT ITS LIFE.

CHAPTER 1

1.7 QUALIFICATIONS. ONLY TRAINED PERSONS SHALL BE CONSIDERED COMPETENT TO DESIGN OR LAY OUT, INSTALL, AND SERVICE WET CHEMICAL SYSTEMS.

CHAPTER 4 COMPONENTS

4.3.2.1 – ALL DISCHARGE NOZZLES SHALL BE PROVIDED WITH CAPS.
4.4.3.1 – ALL MANUAL ACTUATORS SHALL BE PROVIDED WITH OPERATING INSTRUCTIONS
4.4.3.6 – A PLACARD SHALL BE CONSPICUOUSLY PLACED NEAR EACH CLASS K EXTINGUISHER THAT STATES THAT THE FIRE PROTECTION SHALL BE ACTIVATED PRIOR TO USING THE FIRE.
4.4.4.1 – ON ACTUATION OF ANY COOKING FIRE EXTINGUISHING SYSTEM, ALL SOURCES OF FUEL AND ELECTRIC POWER THAT PRODUCE HEAT TO ALL EQUIPMENT PROTECTED BY THE SYSTEM SHALL BE SHUT DOWN.
CHAPTER 4

• 4.4.4.4 – SOLID FUEL COOKING OPERATIONS SHALL NOT BE REQUIRED TO BE SHUT DOWN.
• 4.4.4.7 – A HOOD EXHAUST FAN(S) SHALL CONTINUE TO OPERATE AFTER THE EXTINGUISHING SYSTEM HAS BEEN ACTIVATED UNLESS FAN SHUTDOWN IS REQUIRED BY A LISTED COMPONENT OF THE VENTILATION SYSTEM OR BY THE DESIGN OF THE EXTINGUISHING SYSTEM.

CHAPTER 5

SYSTEM REQUIREMENTS

• 5.1 – WET CHEMICAL FIRE-EXTINGUISHING SYSTEMS FOR THE PROTECTION OF COOKING OPERATIONS SHALL BE LISTED AND SHALL MEET OR EXCEED THE REQUIREMENTS OF ANSI/UL300.
• 5.1.2 – NFPA 96 AND THE MANUFACTURER’S DESIGN, INSTALLATION, AND MAINTENANCE MANUAL SHALL BE CONSULTED FOR SYSTEM LIMITATIONS AND APPLICATIONS.
• 5.2.1 – ALL SYSTEMS SHALL HAVE BOTH AUTOMATIC AND MANUAL METHODS OF ACTUATION.
• 5.2.1.6 – AT LEAST ONE MANUAL ACTUATOR SHALL BE PROVIDED FOR EACH SYSTEM.

CODES AND REFERENCED STANDARDS

• 102.7.1 CONFLICTS.
  WHERE CONFLICTS OCCUR BETWEEN PROVISIONS OF THIS CODE AND REFERENCED CODES AND STANDARDS, THE PROVISIONS OF THIS CODE SHALL APPLY.
• 102.7.2 PROVISIONS IN REFERENCED CODES AND STANDARDS.
  WHERE THE EXTENT OF THE REFERENCE TO A REFERENCED CODE OR STANDARD INCLUDES SUBJECT MATTER THAT IS WITHIN THE SCOPE OF THIS CODE, THE PROVISIONS OF THIS CODE, AS APPLICABLE, SHALL TAKE PRECEDENCE OVER THE PROVISIONS IN THE REFERENCED CODE OR STANDARD.
5.2.1.8 – An audible or visual indicator shall be provided to show that the system has operated, that personnel response is needed, and that the system is need of recharge.

5.2.1.9 – The extinguishing system shall be connected to the fire alarm system, if provided.

5.2.1.10 – At least one manual actuation device shall be located in a means of egress or at a location acceptable to the AHJ.

5.6.1.4 – At least one fusible link or heat detector shall be installed within each exhaust duct opening.

5.6.1.5 – Other than appliances that utilize a downdraft ventilation system, a fusible link or heat detector shall be provided above each protected appliance.

5.6.1.6 – Downdraft ventilation systems requires F.L. or H.D. in the plenum.

5.6.1.6 – Where the pipe or other conduit penetrates a duct or hood, the penetration shall have a liquid tight, continuous external weld or sealed with a listed device.
CHAPTER 6 PLANS AND ACCEPTANCE TESTS

- 6.2 – THE INSTALLER SHALL PROVIDE THE AHJ THAT THE INSTALLATION COMPLIES WITH THE TERMS OF THE LISTING AND THE MANUFACTURER’S INSTRUCTIONS AND OR APPROVED DESIGN.
- 6.4.4 – PIPING INTEGRITY TEST: A TEST USING NITROGEN OR DRY AIR SHALL BE PERFORMED ON ALL PIPING AND VERIFICATION THAT THE AIR OR NITROGEN HAS DISCHARGED OUT OF EACH NOZZLE IN THE SYSTEM.
- 6.4.4.2.3 – THE PIPING SHALL NOT BE HYDROSTATICALLY TESTED.

CHAPTER 6

- 6.4.10.3 – THE INSTALLING CONTRACTOR SHALL COMPLETE AND SIGN AN ACCEPTANCE TEST REPORT ACCEPTABLE TO THE AHJ.

CHAPTER 7 INSPECTION, MAINTENANCE

- 7.2.1 – MONTHLY INSPECTIONS BY OWNER AND RECORDED
- 7.2.6 – THE RECORDS SHALL BE RETAINED FOR THE PERIOD BETWEEN THE SEMIANNUAL MAINTENANCE INSPECTIONS.
- 7.3.3.7 – EACH WET CHEMICAL SYSTEM SHALL HAVE A TAG OR LABEL SECURELY ATTACHED INDICATING THE MONTH AND YEAR THE MAINTENANCE IS PERFORMED AND IDENTIFYING THE PERSON PERFORMING THE SERVICE.
- 7.5 – HYDROSTATIC TESTING OF THE CONTAINERS AND HOSE ASSEMBLIES ARE SUBJECT TO TESTING EVERY 12-YEARS.
NFPA 96 CHAPTER 4

4.1.1.1 – COOKING EQUIPMENT THAT HAS BEEN LISTED IN ACCORDANCE WITH ANSI/UL 197 OR AN EQUIVALENT STANDARD FOR REDUCED EMISSIONS SHALL NOT BE REQUIRED TO BE PROVIDED WITH AN EXHAUST SYSTEM.

4.1.9 – COOKING EQUIPMENT USED IN FIXED, MOBILE OR TEMPORARY CONCESSIONS, SUCH AS TRUCKS, BUSES, TRAILERS, PAVILIONS, TENTS OR ANY FORM OF ROOFED ENCLOSURE SHALL COMPLY WITH THIS STANDARD.

HTTPS://WWW.YOUTUBE.COM/WATCH?V=1CT3MBUWJ-Y

IFC PROVISIONS

• 105.6.30 MOBILE FOOD PREPARATION VEHICLES.
  • A PERMIT IS REQUIRED FOR MOBILE FOOD PREPARATION VEHICLES EQUIPPED WITH APPLIANCES THAT PRODUCE SMOKE OR GREASE-LADEN VAPORS.
  • U-HAUL CONVERTED INTO A FOOD TRUCK.

OTHER MOBILE UNITS
NEW IFC SECTION

- SECTION 319 MOBILE FOOD PREPARATION VEHICLES
  - 319.3 EXHAUST HOOD.
  - 319.4 FIRE PROTECTION.
  - 319.4.1 FIRE PROTECTION FOR COOKING EQUIPMENT.
  - 319.4.2 FIRE EXTINGUISHER.
  - 319.5 APPLIANCE CONNECTION TO FUEL SUPPLY PIPING
  - 319.6 COOKING OIL STORAGE CONTAINERS.
  - 319.7 COOKING OIL STORAGE TANKS.

CHAPTERS 5 AND 6

- 5.4.2 – LISTED HOOD ASSEMBLIES SHALL BE TESTED IN ACCORDANCE WITH UL 710 OR EQUIVALENT.
- 6.1.2 – LISTED GREASE FILTERS AND GREASE REMOVAL DEVICES THAT ARE REMOVABLE BUT NOT AN INTEGRAL COMPONENT OF A SPECIFIC LISTED EXHAUST HOOD SHALL BE LISTED IN ACCORDANCE WITH ANSI/UL 1046 AND SHALL BE DESIGNATED ON THE FILTER.
- 6.1.3 - MESH FILTERS SHALL NOT BE USED UNLESS ANSI/UL (INTEGRATED INTO UNIT)

CHAPTER 7

- 7.5.2.1.2 – PRIOR TO THE USE OF OR CONCEALMENT OF ANY PORTION OF A GREASE DUCT SYSTEM, A LEAKAGE TEST SHALL BE PERFORMED TO DETERMINE THAT ALL WELDED JOINTS AND SEAMS ARE LIQUID TIGHT.
- LIGHT TEST OR SMOKE TEST!
• 7.7.1.2 – In all buildings more than one story in height and in one-story buildings where the roof-ceiling assembly is required to have a fire resistance rating, the ducts shall be enclosed in a continuous enclosure extending from the lowest fire-rated ceiling or floor above the hood, through any concealed spaces, to or through the roof, to maintain the integrity of the fire separations required by the applicable building code provisions.

**EXAMPLE**

• Fire-rated roof-ceiling assembly.

**EXAMPLE**

• Non-fire-rated roof-ceiling assembly.

INTUMESCENT CAULK OR OTHER APPROVED MATERIAL.

EXAMPLE

TWO OR MORE STORIES WITH FIRE-RATED FLOOR-CEILING ASSEMBLY.

EXHAUST TERMINATION

7.8.2.1 – ROOFTOP TERMINATIONS

9 CRITERIA

7.8.3 – WALL TERMINATIONS

7 CRITERIA
CHAPTER 8

• 8.2.2.1 – A HOOD EXHAUST FAN(S) SHALL CONTINUE TO OPERATE AFTER THE EXTINGUISHING SYSTEM HAS BEEN ACTIVATED UNLESS FAN SHUTDOWN IS REQUIRED BY A LISTED COMPONENT OF THE VENTILATION SYSTEM OR BY DESIGN OF THE EXTINGUISHING SYSTEM.
• 8.2.2.3 – THE EXHAUST FAN SHALL BE PROVIDED WITH A MEANS SO THAT THE FAN IS ACTIVATED WHEN ANY HEAT-PRODUCING COOKING APPLIANCE UNDER THE HOOD IS Turned ON.
• 8.2.2.2 – WHEN THE FIRE-EXTINGUISHING SYSTEM ACTIVATES, MAKEUP AIR SUPPLIED INTERNALLY TO A HOOD SHALL BE SHUT OFF.
• SIMILAR BUT DIFFERENT THAN THE IGC

OTHER CHAPTERS

• CHAPTER 9 – AUXILIARY EQUIPMENT
• CHAPTER 10 – FIRE EXTINGUISHING EQUIPMENT (SAME AS NFPA 17A)
• CHAPTER 11 – PROCEDURES FOR INSPECTION, TESTING AND MAINTENANCE
• CHAPTER 12 – MINIMUM SAFETY REQUIREMENTS FOR COOKING EQUIPMENT
• CHAPTER 13 – RECIRCULATING SYSTEMS
• CHAPTER 14 SOLID FUEL COOKING OPERATIONS
• CHAPTER 15 – DOWNDRAFT APPLIANCE VENTILATION SYSTEMS

NEW UL300 ANSUL – 3 GALLON SYSTEM
UL LISTINGS

- HTTPS://WWW.UL.COM/WP-CONTENT/UPLOADS/2014/04/COMMERCIALCOOKING_AG1.PDF

UL 710
Standard for Exhaust Hoods for Commercial Cooking Equipment

THANK YOU!

- ANY QUESTIONS?

Thank You For Attending