Lafayette Fire Department

Commercial Cooking Exhaust Hood & Duct & Exhaust Fan Worksheet

This worksheet is provided as a design aid to assist with the design, selection and/or modifications to your commercial kitchen cooking operations. Please contact the Lafayette Fire Prevention Bureau at: (765) 807-1600.

Applicable Codes / Editions	Indiana Building Code 2014, Indiana Fire Code 2014, Indiana Mechanical Code 2014

PROPERTY INFORMATION

Building Name:

Building Address:

Owner's Name:

Owner's Address:

Owner's Email :

Owner's Phone # :

SYSTEM DESIGNER/CONTRACTOR

Company Name:

Company Address:

Contact Person (Designer):

Phone #:

System Designed by Registered Engineer? ☐ Yes ☐ No

Name of System Designed by Registered Engineer *(stamp included)* :

KITCHEN EXHAUST SYSTEM INSTALLER

Company Name:

Company Address:

Contact Person:

Phone #:

1. DESIGN REQUIREMENTS

Are you exempt from Kitchen Exhaust Hood & Suppression Requirements? (T-507.2)

Yes No

☐ ☐ Is this an office "breakroom", "Church" or "Day Care" facility? (***If no, proceed to Section 2***)

(***If yes, complete remainder of Section 1***)

Check *all* that apply

a) Is your establishment regulated by the Board of Health under 410 IAC 7-24?

☐ Yes?

☐ No?

b) Are you using "Commercial Grade" or "Residential Grade (Domestic)" Appliances?

☐ "Residential Grade" Cooking Appliances?

☐ "Commercial Grade" Cooking Appliances?

☐ **Both** ,"Residential Grade" & "Commercial Grade" Cooking Appliances?

c) What type of cooking process will you be utilizing? (***check all that apply***)

- ☐ "**Warming**" of food?
- ☐ "**Cooking**" of food?
- ☐ **"Frying"** of food?

2. TYPE OF HOOD

"Type I" or "Type II" Hood(s)?

Yes	No	N/A	
☐	☐	☐	**Type I Hood** - Collecting and removal of grease and smoke (IMC 507.2.1)
☐	☐	☐	**Type I Hood (*Solid Fuel*)** - Collecting and removal of grease and smoke (***Separate or "Independent" Hood Provided***?) (IMC 506.3.5)

Yes	No	N/A	
☐	☐	☐	**Type II Hood** - Collecting and removal of steam, vapor, heat, or odors. (IMC 507.2.2)

(**Not required for**: countertop electrically heated appliances such as:
Toasters, steam tables, popcorn poppers, hot dog cookers, coffee makers, rice cookers, egg cookers, and holding/warming oven.
(**Additional heat and moisture loads generated by such appliances shall be accounted for in the design of the HVAC System**)(IMC 507.2.2)

Manufacturer of Hood

Mfg., Make & model of kitchen hood	

3. STYLE OF EXHAUST HOOD

Style of Exhaust Hood(s)

Check *all* that apply

☐ Wall Mounted Canopy	☐ Single Island Canopy	☐ Double Island Canopy
☐ Eyebrow	☐ Back Shelf	☐ Pass Over

4. LISTED & "LABLED" REQUIREMENTS

Yes	No	
☐	☐	Designed per UL 710 Standard- Exhaust Hoods for Commercial Cooking Equipment?
☐	☐	Hood provided with an attached label, symbol, or other identifying mark of the "listed" organization engaged in product evaluation?
☐	☐	Hood "**listing card**" provided with application?
☐	☐	**Detailed Information** provided on Cooking Appliances provided (**see Item # 8 below**)
☐	☐	If hood is ***not listed*** per UL 710 Standards, ***Complete Section # 5 below.***

5. Unlisted & "Unlabled" Hood Requirements

(***Skip this section if not applicable***)

Yes	No	N/A	
☐	☐	☐	Designed per IMC 507.13 Requirements?
☐	☐	☐	Detailed Information provided on Cooking Appliances "Duty Ratings"

6. Size, Location, and Outlet requirements of Hood(s)

Yes No

☐ ☐ Detailed Drawing provided in application?

☐ ☐ Amount of Linear Feet of Hood used in design, provided? _____ (*feet*)

☐ ☐ 6 inch hood "overhang" from cooking appliances provided? (IMC 507.12)

☐ ☐ Each "exhaust outlet" does not serve more than a 12-foot section of hood? (IMC 507.15)

☐ ☐ Maximum Distance from Cooking Surface(s) to lip of hood, per manufacturer's instructions provided?

_____(*inches*)

- Canopy Hoods (*4 feet maximum distance*) (IMC 507.12)
- Non-Canopy Hoods (*3 feet maximum distance*) (IMC 507.14)

7. Detailed Diagram of Cooking Equipment under hood & Appliance Type Information

Yes No N/A

☐ ☐ Detailed Drawings showing dimensional **location(s)** of Cooking Equipment under hood in application?

☐ ☐ Detailed "Appliance Type" **specification sheets** "cut sheets" provided in submittal? (IMC 202)

Check *all* that apply

☐ High-heat appliance(s) (*flue temp. less than 2,000 F.*)

☐ Low-heat appliance(s) *residential appliances* (*flue temp. less than 1,000 F.*)

☐ Medium-heat appliance(s) (*flue temp. more than 1,000 F., but less than 2,000 F.*)

☐ ☐ Hood Front Face Length of Hood (in linear feet) "details" provided in Section 6?

☐ ☐ ☐ Electric Cooking Equipment designed to UL 197 Standards?

☐ ☐ ☐ Gas Cooking Equipment designed to UL 795 or ANSI Z83 Standards?

☐ ☐ ☐ Wood Fired Cooking Equipment designed to UL 2162 Standards?

8. Appliance Duty Rating Classification(s) *("Listed" Hood Classification provided by Mfg)(IMC 507.13)*

Yes No N/A

☐ ☐ ☐ **Extra Heavy Duty** -***Must have "separate" exhaust hood* (per IMC 507.2.4)**

☐ ☐ ☐ **Heavy Duty**

☐ ☐ ☐ **Medium Duty**

☐ ☐ ☐ **Light Duty**

9. Appliance Duty Rating Classification(s) *("ASHRAE Standard 154")*

Yes No N/A

☐ ☐ ☐ **Extra Heavy Duty** *(Solid Fuel- Charcoal, Briquettes, or Wood)*

- Must have "separate" exhaust hood (per IMC 507.2.4)

☐ ☐ ☐ **Heavy Duty**

- Electric & Gas Broilers, Electric & Gas Conveyor Boilers, Gas Open-Burner Ranges (with or without oven), Electric & Gas Wok Ranges, Salamanders

☐ ☐ ☐ **Medium Duty**

- Electric & Gas Ranges (with or without oven), Electric & Gas Griddles, Electric & Gas Fryers (including donut fryers), Electric & Gas Pasta Cookers, Electric & Gas Conveyor Pizza Ovens, Electric & Gas Rotisseries

☐ ☐ ☐ **Light Duty**

- Gas & Electric Ovens, Electric & Gas Steam-Jacketed Kettles, Electric & Gas Steamers, Electric & Gas Cheesemelters.

10. Ductless Hoods (*Skip this section if not applicable*)

Yes	No	N/A	
☐	☐	☐	Designed in accordance with UL 710B Standards?
☐	☐	☐	Listed Information provided in application?
☐	☐	☐	Manufacturer's information provided in application?

11. Hood Material and Gage

Type I Hoods

Yes	No	N/A	
☐	☐	☐	Minimum 20 Gage- Stainless Steel, provided? (IMC 507.4)
☐	☐	☐	External hood joints, seams and penetrations welded, & sealed grease-tight? (IMC 507.7.1)
☐	☐	☐	Internal hood joints, seams, penetrations, filter support frames and other appendages attached inside the hood sealed grease-tight? (IMC 507.7.1)

Type II Hoods

Yes	No	N/A	
☐	☐	☐	Minimum 24 Gage- Stainless Steel, provided? (IMC 507.5)
☐	☐	☐	Joints, seams, and penetrations water tight? (IMC 507.7.2)

12. Hood Supports (IMC 507.6)

Yes	No	
☐	☐	Type I Hoods secured in place by non-combustible supports? (IMC 507.6)
☐	☐	All hoods shall be adequate for the applied load of the hood, unsupported ductwork, and possible weight of personnel working in or on the hood? (IMC 507.6)

13. Hood Clearance to Combustible Materials (IMC 507.9)

Yes	No	N/A	
☐	☐	☐	18 inches to combustible material, provided?
☐	☐	☐	A non-combustible wall or panel, with a smooth, cleanable, and corrosion-resistant surface, provided?
☐	☐	☐	0 inches to non-combustible materials, detailed "installation specifications" provided with submittal?

14. Grease Filters (IMC 507.11 & Table-507.11)

Yes	No	
☐	☐	Grease filters designed to meet UL 1046 Standards? (*No Mesh Filters Permitted)*
☐	☐	Tight-Fitting & Readily Removable without the use of tools? (IMC 507.11.1)
☐	☐	Drip tray provided beneath lower edge of filters and pitched to collect grease? (IMC 507.11.2)
☐	☐	Grease gutters provided to allow access for cleaning? (IMC 507.8)
☐	☐	Filters installed at an angle not less than 45 degrees from horizontal? (IMC 507.11.2)
☐	☐	Drip tray provided beneath lower edge of filters and pitched to collect grease? (507.11.1)

15. Suppression Piping Penetrations into Hood (IMC 507.7.1 & 509.1)

Yes	No	
☐	☐	Shall have liquid tight continuous external weld or be sealed by labeled device.

16. "Compensating Hoods" -make-up air delivered directly into Canopy Hood(s) (IMC 506.3.1.2)

"Fire Damper" Required for:

Yes	No	N/A	
☐	☐	☐	Short-Circuit (Internal Supply Make Up Air) Damper, provided?
☐	☐	☐	Air Curtain or Down Face Damper (Internal Supply-MUA), provided?

17. ALL answers checked "NO", must be provided with a detailed written narrative below:

DESIGN REQUIREMENTS FOR DUCTS

1. Duct size and requirement(s)

Yes	No	
☐	☐	Duct size dimensions and locations shown on plans submitted?
☐	☐	Not interconnected with any other building ventilation or exhaust system?(IMC 506.3.5)
☐	☐	Electrical wiring or wiring systems are not located within duct? (IMC 301.7)
☐	☐	Designed per UL 1978 Standards ? (IMC 304.1 & 506.3.1.1, Exception 1)
☐	☐	Designed per manufacturer's instructions? (IMC 304.1)
☐	☐	A copy of the "manufacturer's installation instructions" included in plan application ? (IMC 304.1)
☐	☐	A copy of the "manufacturer's installation instructions" provided to owner or representative and available on the job site at the time of inspection ? (IMC 304.1)

2. Exhaust Duct Velocity (*Need Specifications on Exhaust Fan to calculate*)

Yes	No	
☐	☐	Sized to meet 500 feet per minute (fpm) minimum requirements? (IMC 506.3.4)

3. Construction "Type I Ducts" (*Not applicable for Type II Hoods*)

Designed per which one of the following:

Yes	No	
☐	☐	.055 inch thick Steel (#16 manufacturer's standard gauge)? (IMC 506.3.1.1)
☐	☐	.044 inch thick (# 18 gauge Stainless Steel)? (IMC 506.3.1.1)
☐	☐	Listed and labeled per UL 1978? (IMC 506.3.1.1)
☐	☐	Labeled grease ducts installed according to mfg. recommendation provided?(IMC 304.1)
☐	☐	All portions of the duct "leak tight" ? (IMC 506.3.3.1)
☐	☐	"Grease Duct Test Leakage Test" to be performed in the presence of Code Official? (IMC 506.3.3.1)
☐	☐	Ducts exposed to outside atmosphere protected against corrosion (IMC 506.2)?
☐	☐	Duct-to-hood joints designed per Code? (IMC 506.3.2.2)
☐	☐	Duct bracing & support shall not penetrate duct walls? (IMC 506.3.3)

4. Duct(s) penetrating fire-resistive construction: (IMC 506.3.10)

Yes	No	N/A	
☐	☐	☐	Interior Floor(s) greater than 2 stories shall be in fire- rated shaft enclosures, with access openings on every floor?
☐	☐	☐	Exterior Wall penetrations allowed only in locations allowed as "unprotected openings" per the *Indiana Building Code*?
☐	☐	☐	Ducts **shall not** pass through Vertical Fire Barrier Walls or Fire Walls, unless:

- Protected by a shaft enclosure protected with a through-penetration fire stop system (TPFS)in accordance with ASTM E 814 & having a "F" and "T" rating equal to fire rating of the assembly? (IMC 506.3.10)
- Having a "**pre-fabricated**" grease duct enclosure in accordance with UL 2221, and being protected with a TPFS system in accordance with ASTM E 814 & having a "F" and "T"? (IMC 506.3.10)Will provide a copy of the "manufacturer's installation instructions" and "listing" (*cut sheet*) with application? (IMC 304.1)

5. Type I Duct(s) "Clearance to Combustibles"

Yes No N/A

- ☐ ☐ ☐ 18 inches to combustible material? (IMC 506.4, 506.5.4, & 506.3.1.2)
- ☐ ☐ ☐ 0 inches to noncombustible material? (Listed Duct Wrap) (IMC 506.3.6)
- ☐ ☐ ☐ Fire-resistance Duct Wrap Materials "Listings" **&** "*Manufacturers Installation Instructions" included with plan submittal*? (IMC 304.1)
- ☐ ☐ ☐ Rated Shaft Enclosure provided? (IMC 506.3.11)

6. Access Panel Openings for Inspection and Maintenance of Grease Ducts

Yes No N/A

- ☐ ☐ ☐ Same material and thickness as duct?
- ☐ ☐ ☐ Provided with "tight-fitting" sliding or hinged doors? (IMC 506.3.8)
- ☐ ☐ ☐ Exhaust ducts in concealed locations, shall be indicated by permanent labels or tags installed in observable locations? (IMC 504.6.1)
- ☐ ☐ ☐ "Listed" Grease Tight Gasket and Sealant provided on openings? (IMC 506.3.8)
- ☐ ☐ ☐ Access doors shall not have fasteners that penetrate the duct, and operable without the use of a tool ? (IMC 506.3.8)
- ☐ ☐ ☐ To be installed according to mfg. instructions & **copies of listing provided in application packet?** (IMC 304.1)
- ☐ ☐ ☐ Sign posted on all access panels marked "**Access Panel- Do Not obstruct**"? (IMC 506.3.11)
- ☐ ☐ ☐ Horizontal Sections of Duct- access panels spaced not more than 20 feet apart? (IMC 506.3.9)
- ☐ ☐ ☐ Vertical Sections, access panels provided at the top of the vertical riser, and at each floor level in multi-story buildings? (IMC 506.3.11)
- ☐ ☐ ☐ Access Panel(s) provided at each changes of direction?
- ☐ ☐ ☐ **Minimum dimension** of "*side openings*" shall be 12 inches on each side? If can't provide minimum dimension, duct openings shall be located on the *top of the duct* (IMC 506.3.9)
- ☐ ☐ ☐ Cleanouts located on the *top of duct*, shall meet a minimum of 1 inch from the sides of the duct, and shall be readily accessible for maintenance? (IMC 506.3.9)
- ☐ ☐ ☐ At least one (1)- 20 inches by 20 inches "opening" located where ductwork is large enough to allow entry of personnel, with adequate supports? (IMC 506.3.8.1)
- ☐ ☐ ☐ Cleanouts located on the *side of ducts*, shall be greater than 1.5 inches above bottom of the duct, and not closer than 1 inch to the top of the duct? (IMC 506.3.9)

7. Prevention of Grease Accumulation in horizontal ducts (Slope Requirements)(IMC 506.3.7)

Yes No N/A

- ☐ ☐ ☐ Slope of ¼ inch per lineal foot toward hood or approved grease reservoir?
- ☐ ☐ ☐ Greater than 75 feet horizontal length, Slope of 1 inch per lineal foot toward hood?

8. ALL answers checked "NO", must be provided with a detailed written narrative below:

DESIGN REQUIREMENTS FOR EXHAUST FAN(S)

Fan Specifications

Manufacturer: _____

Make & Model of Fan: _____

1. Listed and Labeled Fan

Yes	No	
☐	☐	Designed per UL 762 Standard- Restaurant Exhaust Appliances? (IMC 506.5.1)
☐	☐	Equipment or materials has been attached a label, symbol, or other identifying mark of the organization engaged in product evaluation? (IMC 506.5)

2. Hood Controls (*Electrical*)

Yes	No	
☐	☐	Make-up fan(s) " **electrically interlocked**" to operate whenever cooking operations occur and automatically controlled to start and operate simultaneously with exhaust system? (*including"Kitchen" HVAC air supplied at no more than 20%)* **(**IMC 507.2.1.1 & 508.1**)**
☐	☐	Make-up fan "interlocked" with fire suppression system to shut down when suppression system activates? (IMC 508.1)
☐	☐	Exhaust fans continue to operate after the fire extinguishment system activates & supply fans serving exhaust hood assemblies with integrated supply air plenums shall be shut off with the fire-extinguishing equipment is activated.
☐	☐	Fire Alarm(*where required*) is activated upon automatic or manual activation of suppression system? (IFC 907.14)
☐	☐	Gas and/or Electric Cooking Equipment located under hood shall shut down upon suppression activation (& shall require manual resetting prior to fuel or power restoration)? (IFC 904.11.2)

3. Fan Selection

Minimum "**Exhaust Flow Requirements**" (*information required for* **each** *independent hood system*)

Yes	No	
☐	☐	_____ **CFM/ linear foot** required (*per listing provided by manufacturer, or IMC 507.13*)
☐	☐	Minimum Exhaust "Duct Velocity" Requirements (*500 fpm*)
☐	☐	**Actual** Exhaust "Duct Velocity" per design _____ fpm.
☐	☐	**Listed Information** *"cut sheet"* provided in application?
☐	☐	**Manufacturer's installation instructions** provided in application?

Minimum "**Make-up Air Flow Requirements**". (IMC 508.1)

Yes	No	
☐	☐	_____ **CFM** required (*per listing provided by manufacturer*)
☐	☐	Maximum 20% of required CFM delivered through Kitchen HVAC, *("interlocked" to "automatically" operate during cooking operations*).(IMC 505.2)
☐	☐	Amount of make-up air supplied shall be approximately equal to the amount of exhaust air?

Yes No

☐ ☐ Tempered Makeup air provided? (makeup air shall not exceed 10 degrees F conditioned space air)? (IMC 508.1.1)

- **Exception**: *Short-Circuit Make up air delivered within the hood cavity, need not be tempered, except as required per manufacturer's instructions*.

4. Termination of Fan

Yes No

☐ ☐ Roof-top Termination? (**If yes, Complete Section #5 below**)

☐ ☐ Wall Termination? (**If yes, Complete Section # 6 below**)

5. Roof-top Termination(s)

Yes No N/A

☐ ☐ ☐ Exhaust Outlets terminate more than 40 inches above roof? (IMC 506.3.13.1)

☐ ☐ ☐ Exhaust Outlets terminations shall not be directed towards nor impinge on any structure? (IMC 506.3.13.3)

☐ ☐ ☐ Provided with a grease drain system to a rainproof collection container or remote grease trap? (IMC 506.5.2)

☐ ☐ ☐ Hinged Kit provided permit proper inspection and cleaning (IMC 506.5.3)

☐ ☐ ☐ Flexible weatherproof electrical cable to permit proper inspection and cleaning (IMC 506.5.3)

Clearance(s)

Yes No N/A

☐ ☐ ☐ **Minimum 10 feet of horizontal clearance to**:(IMC 506.3.13.3 & 508.1 & 401.4)

- Contiguous and/or adjacent buildings, property lines, and above adjoining grade level.
- Air Intakes Openings : minimum of 10 feet horizontal & 3 feet above

☐ ☐ ☐ **Minimum of 5 feet of clearance from**: (IMC 506.3.13.3)

- Contiguous and/or adjacent buildings, air intakes, property lines, and above adjoining grade level, **when exhaust outlet discharges away from such locations**.

Safe Access (**IMC 306.5**):

Yes No N/A

☐ ☐ ☐ Equipment located on structures 16 feet in height or greater, require permanent ladders?

☐ ☐ ☐ Equipment located on sloped roofs" greater than 25 percent (*3 in 12*) at any height, are required to have a platform not less than 30 inches in any dimension and provided with guardrails not less than 42 inches above the platform? Access to equipment platforms shall not require walking on roofs have a slope greater than 33 percent (4 in 12)?

☐ ☐ ☐ Equipment located outside of roofline, shall be provided with safe access and work platform for service, repair, and maintenance.

☐ ☐ ☐ A receptacle outlet shall be provided at or near the equipment.

6. Wall Termination(s) (IMC 506.3.12.2)

Yes No N/A

☐ ☐ ☐ Exhaust Outlets terminations shall not be directed towards nor impinge on any structure? (IMC 506.3.13.3)

☐ ☐ ☐ Provided with a grease drain system to a rainproof collection container or remote grease trap? (IMC 506.5.2)

☐ ☐ ☐ Hinged Kit provided permit proper inspection and cleaning (IMC 506.5.3)

☐ ☐ ☐ Flexible weatherproof electrical cable to permit proper inspection and cleaning.

Clearance(s) (IMC 5065.3.12)

Yes No N/A

☐ ☐ ☐ Permitted where does not create public nuisance or fire hazard?

☐ ☐ ☐ Shall not be located where "protected openings" are required per IBC?

☐ ☐ ☐ Shall not be located within 3 feet of exterior openings (window, doors, HVAC)?

☐ ☐ ☐ **Minimum 10 feet of horizontal clearance to**: (IMC 506.3.13.3)

- Contiguous and/or adjacent buildings, property lines, and above adjoining grade level.

Air Intakes Openings : minimum of 10 feet horizontal & 3 feet above

☐ ☐ ☐ **Minimum of 5 feet of clearance from**: (IMC 506.3.13.3)

- Contiguous and/or adjacent buildings, air intakes, property lines, and above adjoining grade level, **when exhaust outlet discharges away from such locations**.

☐ ☐ ☐ **Minimum of 3 feet of clearance of exterior openings** *(windows, doors)***?**

Safe Access (IMC 306.5):

Yes No N/A

☐ ☐ ☐ Equipment located outside of roofline, shall be provided with safe access and work surface for inspection and cleaning?

☐ ☐ ☐ A receptacle outlet shall be provided at or near the equipment (IMC 306.5.2)

7. ALL answers checked "NO", must be provided with a detailed written narrative below

***DISCLAIMER**: The information presented above is the basic requirements for commercial construction and is not to be relied upon for the complete requirements for commercial construction. It is to your advantage to use a design professional or a professional contractor to assist you with those areas of construction with which you are unfamiliar. Unfamiliarity with the applicable codes may cause unplanned delays and unforeseen costs to comply with code regulations.*

Owner or General Contractor

(Printed Name)

(Signature)

(Date)

(Company Name)

(Email and Phone Contact)