

# Chapter Seven – Hoods

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## Hoods

Hoods, the most visible component of a commercial kitchen ventilation system, capture heat and effluents in the thermal plume rising off the top of cooking equipment. The hood is the primary filtration system, the size and make depending on the number and type of cooking appliances used. All Type I hoods contain baffle filters, modular extractors, filtration or cyclic water wash systems.

In theory, the closer the hood is to the cooking surfaces the more efficiently it will draw. However, this efficiency is very dependent on the draw of the fan. Efficiency is tied to the hood configuration and features as well as the design airflow. The fan must have sufficient capacity to exhaust the volume of air required by the design.



*Steam and smoke being captured by the hood*

**Note to Inspectors:** In a majority of locations, the exhaust cleaning certificate will be placed on the hood.

## Type I Hoods

Hoods may or may not be listed. However, unlisted hoods must meet the criteria of applicable national and local codes. Air requirements are based on the square footage of the hood capture area. These air requirements are higher than for listed hoods.<sup>1</sup> Fire actuated dampers are not permitted in unlisted hoods. Unlisted hoods are usually built locally by HVAC shops and need careful inspection when installed.<sup>2</sup> Listed hoods are generally classified as hoods with or without dampers.

Hoods classified as “Type I” must be used over all grease-producing cooking appliances. NFPA 96 and IMC require that Type I hoods be built to specific requirements to provide fire protection.<sup>3</sup>

Hoods designed for collecting cooking vapors shall be constructed of and be supported by steel not less than 1.09 mm (0.043 in. No. 18 MSG) in thickness, stainless steel not less than 0.94 mm (0.037 in. No. 20 MSG).

All Type I hoods must have the following features:

- Continuously welded, liquid tight seams (unless listed for alternate method)
- Acceptable clearances from combustibles
- Ability to capture all grease vapors
- Suspension by noncombustible hangers
- Supports strong enough to handle load bearing items such as grease buildup and personnel working on the system
- Accessibility for cleaning and inspection
- Penetrations in hoods must be sealed in an approved manner, particularly piping for the fire-extinguishing system
- Painted hoods are allowed, exterior only



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<sup>1</sup> See *ASHRAE STANDARD 154*

<sup>2</sup> For more information on hood and duct construction, see *SMACNA Installation of Commercial Kitchen Exhaust and Makeup Air Systems Manual*.

<sup>3</sup> See *NFPA 96, 5.1.1*

According to IMC single island hoods must overhang the cooking equipment by a minimum of 15.2 cm (6 in.) on all four sides of the hood. However, it is recommended that the overhang be extended to 30.5 cm (12 in.). It is also recommended that there is a minimum overhang of 15.2 to 30.5 cm (6 to 12 in.) beyond the deepest cooking appliance (usually ovens) for the proper front capture of steam and heat when opened. Minimum overhang is established by listing test.

Both IMC and ASHRAE state that greater overhangs (reaching 30.5 cm or 12 in.) will increase capture and containment.

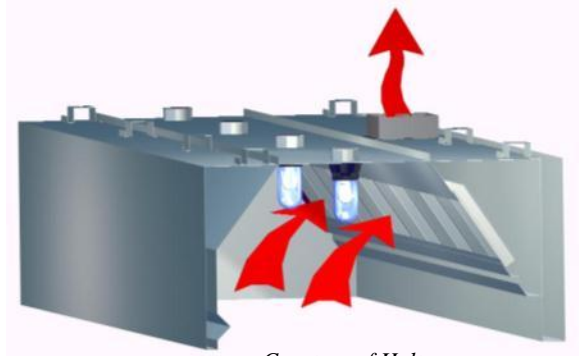
### Construction Requirements

NFPA 96, Chapter 5.1 provides construction requirements for Type I hoods.

- The hood shall be constructed of and supported by steel not less than 1.09 mm (0.043 in.) (No. 18 MSG) in thickness, stainless steel not less than 0.94 mm (0.037 in.) (No. 20 MSG) in thickness, or other approved material of equivalent strength and fire and corrosion resistance
- All seams, joints, and penetrations shall have a liquidtight continuous external weld to the hood's lower outermost perimeter or other liquid tight construction method approved by the listing
- Seams, joints, and penetrations of the hood may be welded so long as the weld is smooth, not creating a grease trap, and is cleanable
- Internal hood joints, seams and filter support frames, inside the hood shall be scaled or otherwise made greasetight
- Penetrations shall be sealed by devices that are listed
- Listed exhaust hoods with or without exhaust dampers shall be constructed and assembled in accordance with the listing

#### Exhaust Air

Building designs must address regulations governing ventilation, air movement, air quality and volume. Because of its fire history, the kitchen exhaust system is required to meet specific, more stringent construction and installation standards than other types of ventilation.



*Courtesy of Halton*

### Type I Listed Hoods

Listed hoods are constructed and installed in accordance with the manufacturers' listing.

- Listed hoods must meet UL Standard 710 protocol or equivalent<sup>4</sup>
- They may contain dampers and automatic wash-down (water wash) systems
- They will contain a permanent tag that defines related performance criteria
- Listed hoods are generally more energy efficient. Air requirements are based on length. There is no consequence for a deeper (wider) hood that affords improved capture as the overhang increases. Listed values are not to be used as design airflow; exhaust requirements may be greater than listed values depending on appliance heat output.

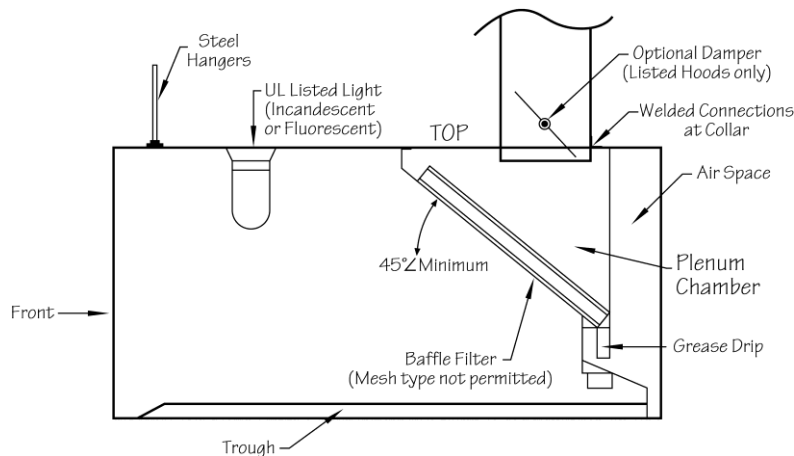


<sup>4</sup> For recommended flow rates, *ASHRAE STANDARD 154*.

## Components of the Exhaust Hood

Common components of the canopy exhaust hood design are:

- Trough
- Plenum chamber
- Inside of hood
- Fire-Extinguishing System
- Outside of hood
- Duct collar
- Grease drip pan
- Baffle Filter or Cartridge
- Dampers (only in listed hoods)



Graphic example of generic components of a canopy style hood. Not to scale.

## Common Hood Designs

### Hood Designs

There are two basic hood designs:

- Canopy (overhead)
- Galley (back-shelf)

The size of the exhaust hood depends on the number and type of cooking appliances used. All Type I hoods utilize filtration devices and a fixed pipe fire-extinguishing system.

### Canopy Hoods

The names hood, canopy or ventilator can be used to describe a canopy hood.

The three primary designs of canopy hoods are:

- Wall mounted (most familiar type against a wall)
- Single island (open on four sides with a single line of cooking equipment)
  - Can be a single row of filters or double row (commonly referred to as V bank)
- Double island (open on four sides with cooking equipment back to back, commonly referred to as a V bank)



An example of a canopy style hood