

KITCHEN HOODS

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NFPA 96, "Vapor Removal From Cooking Equipment" requires that all portions of the kitchen hood be located 18" from combustible materials, 3" from limited-combustible materials, or 0" from non-combustible materials.

Combustible materials are defined as materials that are more combustible than limited-combustible materials; and include sheetrock on wood stud walls and combustible fibrous ceiling tiles.

Limited-combustible materials are defined as materials having a structural base of non-combustible materials, with a surfacing not exceeding a thickness of 1/8" with a flame spread rating not greater than 50, or materials with a flame spread rating not greater than 25 (even when cut); and include sheetrock on metal stud walls or steel joists.

Non-combustible materials are defined as materials which will not ignite, burn, or support combustion, or release flammable vapors; and include plaster on metal lath on metal stud walls, masonry block walls, and non-combustible mineral wool ceiling tiles.

These requirements can create problems, particularly in renovations, where the top of the hood, which is usually 8'6" above the floor, may conflict with wood floor joists or wood roof trusses above; or the back of the hood is against a combustible wood-framed wall. Either these surfaces should be built of non-combustible construction, or they must be protected.

NFPA permits reducing the clearances to combustible materials to 3" when the material is protected with 22 gage sheetmetal on 1" mineral wool batts (reinforced with wire mesh or equivalent), spaced out 1" on non-combustible spacers. That is: combustible surface, 1" airgap, 1" mineral insulation, 22ga. sheetmetal, 1" airgap, hood. The protection must extend far enough beyond the hood, so that no portion of the hood is within 18" of the combustible construction.

Clearance to combustible materials may be reduced to 9" when protected with 28 gage sheetmetal spaced out 1" on non-combustible spacers.

Another solution is to use a UL-listed insulation product such as Pabco[®], Super Firetemp L[®], zero clearance insulation. 2-1/2" insulation permits zero clearance to combustibles. This insulation board can be fixed to the wall or ceiling, and the hood butted up to it, with no airgap required. This product may be somewhat difficult to apply in this application, and is most often used to insulate kitchen hood exhaust ductwork.

Kitchen Hood Exhaust Ductwork:

The same clearance requirements apply to the kitchen hood exhaust ductwork. Most often the ductwork is insulated with the zero clearance insulation described above when protection is required, e.g., where ductwork passes through a combustible wall, through combustible floor construction, or through wood roof trusses. Other products include: Nelson[®] FSB flameshield blanket[®] (two layers), 3"; or Firemaster[®] duct wrap (two layers).

Kitchen Hood Location:

It is preferable to duct directly from the top of the hood to the roof, keeping the exhaust ductwork as short as possible. This minimizes construction cost, and the maintenance costs associated with cleaning this ductwork. If the hood is not located on the top floor, then a rated enclosure is required for the duct at all upper levels.

Sidewall exhaust requires a masonry wall and a 10' clearance to grade. In addition all fresh air intakes must have a minimum of 10' horizontal separation and greater separation vertically.

Kitchen Hood Size:

Kitchen hoods should extend 6" beyond the cooking equipment on the sides and front, and 12" beyond the back for island hoods. Generally this makes most hoods 42" deep, and 12" wider than the cooking equipment.

Hoods are very expensive, and it is desirable in most cases to make them as small as possible, to lower the cost of the hood, the costs of the associated exhaust ductwork, and the costs of making up air to the space. A bigger hood requires more air to be exhausted, through bigger ductwork, and more air to be "made-up". More make-up air requires in turn, larger air handling equipment, and results in higher heating bills.

Only locate equipment under the hood that requires a hood, that is, grease producing equipment. Tables or counters should not be under hoods. Convection ovens can be located adjacent to a hood and vented to the hood, or they can be under the hood which may be desirable to reduce heat gain to the kitchen. Ranges and steam kettles, tilting skillets should be under hoods. It is best to avoid charbroilers where possible (from a cost standpoint) because of their large exhaust requirements.

Kitchen Hood Make-Up Air:

Many times it is possible to use the air that is being supplied to an adjacent dining room or cafeteria for ventilation (20 cfm per person), to make-up the air being exhausted from the kitchen hood (approximately 50+ cfm/sf hood). The make-up air is introduced to the dining hall or cafeteria through air handling units or unit ventilators, then is transferred to the kitchen through transfer grilles or fans and ductwork, then is exhausted out the hood. This is efficient, and helps to keep the kitchen at a reasonable temperature (especially if the air is air-conditioned during the summer). Another option would be to use an air-to-air heat exchanger to provide ventilation air to the dining area, and use a compensating hood in the kitchen. A compensating hood is one where the make-up air is supplied directly under the hood, often unheated. This scheme involves a lot more equipment, is expensive, saves little or no energy (depending on whether the compensating air is heated or not), and results in a less comfortable kitchen.