GREASE FILTERS/ EXHAUST HOODS

Grease filters are designed to remove grease particles from the exhaust air stream. Exhaust systems that have broken, missing, or undersize filters are prone to collect accumulations of highly combustible grease deposits throughout the entire duct system. Because of the chimney effect in vertical ductwork, a very intense rapidly spreading flash fire can engulf the entire system.

Type 1 hoods shall be equipped with approved grease filters or grease extractors designed to remove grease from the exhausted air.

The most common grease filters currently in use are the baffle-type. Baffle-type filters simplify the cleaning process since most of the grease deposits run off the baffles to a collection device. The old style mesh-type filters are not acceptable in new installations. NFPA 96, ANSI NFS Standard 2, and UL 1046 no longer recognize the old style mesh type filters. They may present a fire hazard and decrease airflow as they become clogged with grease.

Grease filters and extractors shall be of such size, type, and arrangements as will permit the required quantity of air to pass through such units at rates not exceeding those for which the filter or extractor was designed and approved. The optimum operating velocities, measured in feet per minute (FPM), vary from filter to filter. Therefore, the manufacturers should be consulted to obtain the appropriate rates for each specific filter.

It is important to select the proper number of grease filters for the hood. Too few filters increase the resistance to airflow and raise the filter cleaning frequency.

The minimum required number of filters for a particular hood can be calculated by dividing the total volume of air to be exhausted, in CFM, by the optimum operating velocity of the filter, in FPM. This number is then divided by the actual square footage of the filter (excluding the frame). The resulting figure represents the minimum number of filters required to efficiently remove the grease from the exhausted air.

Example: Assume the following:

1. An exhaust hood with a minimum required airflow of 3,250 CFM.
2. Baffle filter with a nominal size of 20 x 20, have an actual filtering surface of 18 x 18. (Nominal size minus the frame equals the actual filtering area.)
3. An optimum operating velocity of 360 FPM for the filter.
   Volume of Air Exhausted = Filter Area Needed (sq.ft.)
   Operating Velocity of Filter (FPM)

   3,250 CFM =9 sq.ft.
   360 FPM
   Next, convert the actual filter area to square feet:

18” x 18” = 324 sq. in.

324 sq. in. =2.25 sq. ft.

144 sq. in./sq.ft.

Then divide the 9-sq.ft. of needed filter area by sq. ft. per filter:

9 sq. ft. = 4 Filters

2.25 sq.ft.

Therefore, in this example, 4 filters would be required to provide adequate removal of grease.

Filters shall be installed at an angle not less than 45 degrees from a horizontal and shall be equipped with a drip tray beneath the lower edge of the filter. This enables the grease to be collected in the drip tray and avoids grease dripping into food, or on food preparation surfaces.

Any space in the hood not occupied by a filter should be blanked off with sheet metal.

The minimum distance between the lowest edge of the grease filter and the actual cooking surfaces shall be as follows:

Type of Cooking	Minimum Separation Required
No exposed flame grill, French fryers, etc.	2 Feet
Exposed flame and burners	2 Feet
Exposed charcoal and char broiler-type fires	3 ½ Feet

Proper hood design will keep the temperature at the filters less than 200 degrees. When the temperature at the filters is less than 200 degrees, the grease deposits will be brownish in color and can be easily removed. When the temperature exceeds 200 degrees, the grease tends to bake on the filter and becomes extremely difficult to remove.

A typical kitchen ventilation system includes an exhaust hood or canopy, ductwork, fan system and a means of providing adequate make-up air. The entire system must constitute a fire safe assembly within the building.

Exhaust hoods and canopies capture heat and contaminates in the air by means of filters, extraction baffles (cartridges), and water mist systems. There are many style variations of hoods with canopy styles-a large box with and open bottom-being the most common. Style selection is based on the type of oven and the expected contaminates to be removed. While there are several styles of hoods, all fall within two major categories:

1. Type I hoods carry a listing label and are manufactured and installed according to the manufacturer’s and listing agencies requirements. They are designed to handle grease and include a number of integrated components within the hood.
2. Type II hoods are used in the collection of steam, vapor, heat, and odors-but not grease. The two classifications of Type II hoods are condensate and heat/fume.