



InterAgency Review Council

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Ventilation Committee

Background:

The kitchen ventilation criteria flow chart was developed by the commercial kitchen ventilation (CKV) committee of the Minnesota Inter Agency Review Council (IARC) as a guide for determining the type of hood required for various cooking or heat processing applications. Use this flow chart as a guide, not as rule or regulation. The flow chart only work when you follow the decision logic line i.e., answer the questions in line, one at a time. The “Other Criteria” mentioned at the top of the chart are other critical variables that impact hazards associated with heat processing of foods. When properly analyzed, these other criteria will sway your decision about ventilation requirements one way or another.

Ventilation requirements are driven by many different variables ranging from types of equipment, heat transfer methods, menu, loading, capacities, floor area, ceiling height, air changes per hour, fresh air percentages, mechanical systems sizing, controls, distribution, installation, commissioning (balancing etc.), preventive maintenance, occupancy, etc. Design decisions and regulatory approval for different ventilation approaches should consider all variables relating to a systems effectiveness and safety in order to minimize hazards to people, property, and food products.

There are different kinds of hoods, ventilators, extractors, filters and other methods for the capture and containment of heat, smoke, moisture and grease laden vapors, each with an optimal application given menu, budget, equipment, space and design intent. Cooking and heat processing foods generate grease laden vapors, which in turn precipitate to create grease deposits on various surfaces. These depositions are fire hazards since grease will spontaneously ignite given adequate heat and oxygen. Type I (formerly known as class 1) hoods are used where grease deposition from cooking fatty

foods (or cooking with oil) creates a fire hazard by leaving a film of grease on surfaces in and around the cooking and ventilation equipment. Ducts serving type I hoods must be liquid tight welded black iron with clean-outs located at offsets and at other intervals (see Minnesota Building Code) to enable periodic duct cleaning.

Grease filters or UL 710 listed grease extractors used at the inlet of a type I exhaust hood or assembly serve two purposes: to collect and contain some grease and to provide a mechanical barrier to fire. EPA 202 and other test methods that quantify volatile organic compounds (VOC's) and condensable particulates establish standards for acceptable levels of grease and aerosols for a particular piece of equipment for a specific menu item(s) in a laboratory setting. Having such a listing may reduce the requirement from type I to type II, but other criteria must be met in order to safely allow installation without any kind of exhaust (to outside) and/or replacement air. The first question in the General Ventilation Criteria Flow Chart is "Does the process generate grease laden vapors or smoke?" Small countertop electric enclosed compartment ovens that transfer heat via microwave or light radiation, or convected hot air or steam are deemed to not produce grease laden vapors and smoke. Judgment is required to prevent potential abuse caused by menu, loads or confined, poorly ventilated spaces.

All commercial kitchen ventilation systems shall conform to NFPA 96, the national standard for ventilation control and fire protection of commercial cooking operations. Surface fire suppression is required for all open flame (not within a closed compartment/burner assembly) equipment, along with gas or electric broilers, griddles, fryers, braising pans, woks and other cooking equipment where cooking surfaces can bring a volume of oil to its auto ignition temperature. Where surface fire suppression is required, so too is fire suppression required in the plenum, at the duct collar and throughout the duct. Type II hoods do not have grease filters and do not need welded liquid tight heavy-duty ducting systems.

Refer to the authority having jurisdiction for specific approval requirements.