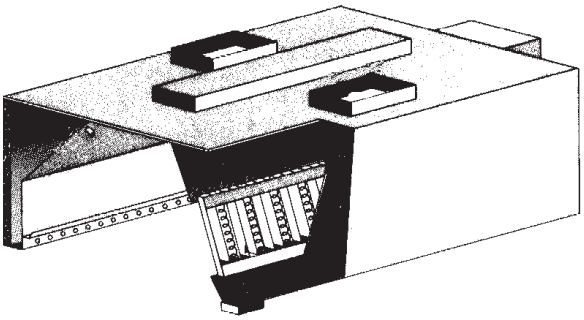

Commercial Kitchen Hoods

Exhaust fans and exhaust hoods are commonly used in commercial establishments to promote indoor air quality. They remove pollutants such as smoke, heat, odors, noxious gases and grease. Some of these devices, such as kitchen exhaust hoods, are covered by guidelines and standards as well as codes and regulations that are intended to ensure public safety.

A particular safety concern is fire. National Fire Protection Association (NFPA) publication 96, a standard referred to by many codes, requires that exhaust air volumes for hoods be sufficient for cooking and removal of grease-laden cooking vapors and that minimum duct velocity be 1,500 feet per minute (fpm). In addition, codes may require minimum quantity of air flow based on cooking equipment, floor area of the kitchen or some other easily measured quantity. A minimum air velocity is needed to capture and transport pollutant particles (such as grease) and to prevent their deposit on surfaces. Obviously, grease deposition is a potential fire hazard.

Makeup Air Needed

The air that is exhausted from the building must be replaced. The replacement air is called makeup air. There are two main concerns when providing makeup air – cost and safety.

Cost

Providing makeup air from conditioned areas can be very expensive because this conditioned air is replaced by outside air. The outside air imposes an additional heating/cooling load on the building. For example, an extra ton of air conditioning may be required for each 250 cfm of makeup air. At this rate, it does not take a very large hood to require an extra 10 to 20 tons of air conditioning and cost you an extra 10 to 20 tons of equipment and operating expense.

Safety

Although makeup air can be expensive, the lack of adequate makeup air provisions could be disastrous. Without adequate provisions for makeup air, the exhaust fan could pull a vacuum as it tries to suck in air from outside.

If you have a gas-burning appliance such as a water heater or furnace, air and combustion products could be sucked down the stack and into the building instead of vented outside. This is both a fire and a safety hazard and can be life-threatening. To prevent this problem, NFPA 96 calls for no more than 0.02 inches of water suction when the exhaust is operating. This is a low value and, in effect, means that if you can feel air being drawn inside at door cracks (in the absence of wind) you may be in violation of the standard. A rush of air inside when the door is opened definitely means problems.

A Better Way

It may seem that you are caught between excessive cost and safety, but there is a solution. The better way is to provide most makeup air directly to the hood without prior conditioning. Some hoods have built-in provisions for supplying most of the makeup air required by them. Although these installations cost more compared to hoods that do

not supply makeup air, they actually have a cost advantage because they greatly reduce the air conditioning cost and also the cost of adequately sized air conditioning equipment. If it is not possible to install such a hood, some of the same benefits may be obtained by supplying an outside vent for the hood. This could consist of well-designed duct work or be as simple as an open (and screened) kitchen window.

Proper maintenance provisions include:

1. Accessibility for cleaning. Filter, fans and other components requiring regular service should be easily accessible.
2. Regular, routine cleaning. It is essential that components such as filters, which require periodic cleaning, be cleaned in a timely manner and in accordance with applicable regulations (codes prohibit the use of flammable cleaners). Failure to do so can result in poor performance and safety hazards.
3. Airflow should be checked for quantity and direction and adjusted as needed. Because the proper balance of airflow can greatly affect air conditioning performance, it is a good idea to check the hood's airflow when performing annual preseason maintenance on the air conditioning system.

Competent Contractor

Providing proper exhaust systems and adequate makeup air can be crucial to the safety of your business and to your cost of doing business. It also may be regulated by civil authorities and insurance companies. Because it is cheaper and safer to do it right, your exhaust system (hood and makeup air system) should be designed and installed by a competent contractor.

License, Permits and Inspections

Some municipalities and parishes require licenses (certification), permits and inspections. These requirements are designed to protect the consumer. A license (certification) means that the holder has a degree of competence and proficiency in the trade covered by the license (certification). A permit system may prevent costly mistakes that are not allowed under codes. Inspections are intended to assure that work is done safely according to code. If you sidestep the system, you may end up with an unsafe installation for which you are liable. Check with the parish and municipal authorities to determine requirements before installing or repairing any heating or cooling equipment, including kitchen hoods.

Author:

David Bankston, Professor, Department of Food Science

Visit our Web site: www.lsuagcenter.com

Louisiana State University Agricultural Center
William B. Richardson, Chancellor
Louisiana Agricultural Experiment Station
David J. Boethel, Vice Chancellor and Director
Louisiana Cooperative Extension Service
Paul D. Coreil, Vice Chancellor and Director

Pub. 2518 (online only) 7/10 Rev.

Issued in furtherance of Cooperative Extension work,
Acts of Congress of May 8 and June 30, 1914,
in cooperation with the United States Department of Agriculture.
The Louisiana Cooperative Extension Service
provides equal opportunities in programs and employment.