Clear The Air

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The role of pollution control units in commercial kitchens

The kitchen ventilation system is one of the most complex parts of a food service establishment. With increased focus on clean air and the triple bottom line, exhaust systems with pollution control units have become an important factor to consider when constructing a new kitchen.

The rise in multi-use buildings and urban landscapes has increased the focus on odors from commercial kitchens. No one wants their office, apartment or yoga studio smelling like the neighboring restaurant's fried onion special or having grease drip onto their windows from the commercial kitchen's exhaust.

Pollution control units (PCUs) remove smoke and grease particles from the air stream in commercial kitchen exhaust systems. They work in tandem with—not instead of—kitchen hoods and exhaust and grease trap systems.

How They Work

There are two main types of PCUs: electrostatic precipitator and mechanical filtration units.

Electrostatic precipitator units work by using high-voltage ionization and electrostatic cells. By charging both large and microscopic particulates, a unit is able to collect them on oppositely charged plates. These units are typically better at smoke removal than filtered units. Electrostatic precipitator units have a higher up-front cost but do not have the expense of changing filters. Because of the technological nature of the system, they do require electronics maintenance.

Mechanical filtration units work by using a series of high-efficiency filters to capture the particulates. Typically a three-filter system, many models use a combination of high Merv-rated filters, HEPA filters and carbon to remove particulates from the air and treat any odors. These units have a lower up-front cost, but maintenance requires replacement and disposal of filters.

Do You Need Them?

The International Mechanical Code (IMC) and the NFPA 96 do not currently require the use of PCUs. However, local codes in certain areas of the country do. For example, PCUs are required by code in New York City and Seattle. With no nationally recognized standard, restaurant owners may struggle with awareness and proper maintenance of these units. That is why it can be important to have an experienced team to help you manage the full kitchen waste and exhaust system.

If your locale does not require them by code or ordinance, then you need to determine if your facility could benefit from having one. Viable reasons for a PCU

include the nuisance factor, complaints from neighbors, concern about the environment, attention to grease buildup on the roof and protecting the integrity of the hood fan.

One of the most frequent applications of PCUs involves restaurants on the ground level of high-rise buildings. These facilities need to discharge exhaust without having to run miles of ductwork to the roof. The discharged exhaust needs to be as clean and odorless as possible for passerbys and neighboring residents and businesses. Multi-use buildings are another example where odor and exhaust can be a more “in your face” problem that a PCU can solve.

Preventive Maintenance

As with all aspects of your kitchen waste management, proper and sufficient maintenance is the difference between smooth sailing and rough waters.

Annual maintenance costs vary based on cooking load, hood filters and the type of food being cooked. When evaluating maintenance costs, consider the following:

• The type of cooking equipment you are using: ranges, griddles, deep fryers, ovens or a combination

• The types food you are cooking (higher-fat products yield more grease)

• The ventilation design of the facility, including ductwork, fans and makeup air systems

• The location and configuration of the restaurant and kitchen related to other buildings

You can plan on a bare minimum of semi-annual maintenance and more frequent for high usage and/or high-grease-load kitchens. Monthly inspections are recommended to avoid fire and safety hazards.

Mechanical filtration systems have multiple filtration levels and may not require all filters be replaced during each service visit. Meaning, the first-level filter may require more frequent replacement than a filter further down the filtration stream. Each unit and facility is different.

Much like other grease-producing appliances and waste removal systems, PCUs must be treated as a fire hazard. Because they filter hazardous, flammable materials, such as grease vapors and particulate matter, they must be integrated into your maintenance and fire safety plan.

While it is not required by national standard, if you do use a PCU, you must comply with NFPA 96, the Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations, (Section 9.3.3): "Any equipment, listed or otherwise, that provides secondary filtration or air pollution control and that is installed in the path of travel of exhaust products shall be provided with an approved automatic fire-extinguishing system, installed with the fire-extinguishing system manufacturer's instructions."

Bottom Line Impact

A holistic approach to kitchen exhaust and ventilation is necessary to make sound decisions on whether to use a PCU. The hood is your first line of defense, whether you employ a PCU or not. The more grease that can be removed at the hood lowers the operating cost of the PCU, as it prevents grease buildup in the PCU.

Expect to pay $10,000 to $40,000 for the initial installation of an electrostatic precipitator unit, com pared to $6,000 to $25,000 for a mechanical PCU. Preventive maintenance is the name of the game and can run up to $10,000 or more a year to maintain properly.

No filtration system can ever eliminate 100 percent of smoke and odors, but it can certainly improve the quality of discharge. All PCUs distribute the exhaust to the atmosphere; whatever particulates or odors remain dissipate into the atmosphere.

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