



“Better Equipment Placements for Improved Kitchen Ventilation Efficiency”

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Just as a manufacturing plant must be laid out to minimize production costs and maintain quality standards, the kitchens of all foodservice facilities must be designed to meet the same criteria. Proper equipment layout and placement can make the difference between a profitable operation and a losing one. The equipment lineup under the hood can make or break your energy bill while also having a major impact on comfort for your cooks and customers. Without comfortable cooks, you risk higher turnover. Without comfortable customers, well...you get the picture. This article will provide you with some low-cost and even no-cost ways to maximize your bottom line profits by employing better equipment placements

to improve kitchen ventilation efficiency.

Equipment Position Factor...

Many operators have issues with excessive heat and/or cooking effluent spilling out in their kitchens and often even into their dining areas. As an example, a typical six-burner range full on, with nothing cooking on it, emits 120,000 BTUs of heat into the kitchen per hour, which is equal to TEN TONS OF AIR CONDITIONING. Imagine what impact that can have on your air conditioning system and electric bill if your kitchen exhaust system is not venting the heat efficiently!

Recommended Hood Overhangs for 48 Inch & 54 Inch Drop Hoods

Equipment	Front	Side
Charbroiler	18 inches – 24 inches	12 inches
Fryer or Griddle	12 inches	6 inches – 12 inches
Conveyor Oven	6 inches	12 inches beyond conveyor end
Convection Oven	24 inches	6 inches
Dishwasher	12 inches	24 inches beyond inlet end

Courtesy:: ASHRE

Extracting all of the heat, grease and cooking effluent from the kitchen is not an easy job.

The minimum hood capture and containment rate can vary significantly based on the position of equipment under the hood. For example, a heavy-duty appliance, such as a charbroiler, at the end of a hood is more prone to “spillage” [heat and effluent not captured by the hood] than the same appliance located in the middle of the hood. Proper positioning of appliances, by locating those with the highest effluent and heat producing attributes towards the middle of the hood, will go a long way in reducing exhaust rates, providing a more comfortable cooking environment and saving energy.

Front to back positioning of equipment or overhang can also dramatically affect the exhaust rate needed according to recent ASHRAE [American Society of Heating, Refrigerating and Air-Conditioning Engineers] and industry research. To help maximize the efficiency of your kitchen ventilation system, the chart on the previous page lists the ideal hood overhang measurements for some of the most notorious sources of heat and effluent.

The Push-Back Theory...

We all know that it is impossible to predict all of the variables that an exhaust system will face in the kitchen. The most experienced foodservice designer can create the optimum system only to have it fail once installed and made operational. For this reason, commercial kitchen ventilation design combines equal parts of art and science to create an effective way to keep your kitchen clean, comfortable and at top performance.

To better understand the ways in which kitchen exhaust hoods fail and how they can be made to perform better, researchers at the Architectural Energy Corporation’s CKV Laboratory are using an airflow visualization technology, known in the commercial kitchen ventilation industry as the Schlieren System, which actually allows them to see how air moves around under the exhaust hood. During the course of their research, they discovered some very surprising results.

By closing the space behind the appliances that are under the hood, the researchers learned that the hood performed much better at exhausting effluents, heat and moisture associated with the cooking process. This



Pushing back the appliances allows for more hood overhang (6 inches is minimum code requirement), which improves capture and containment of cooking effluents and heat.

Photo Courtesy: D.J. Horton & Associates

was a significant discovery, and the fix adds virtually no cost to the operator except perhaps a few dollars for extra piping elbows and swivels for quick disconnects. Simply put, pushing all of the appliances back closer to the wall can prevent an exhaust hood from spilling those cooking effluents and heat into the kitchen. This has become known as the Push-Back Theory. Putting it in to practice can translate into a cooler kitchen, happier cooks and some significant energy savings! Just remember when doing so that you follow the equipment manufacturer’s recommendations so you don’t exceed specified clearances for a particular appliance.

To learn more about this phenomenon log on to www.archenergy.com/service/food.

If you are interested in learning more about maximizing your profits through improved kitchen efficiency or how GFEN can assist you in the evaluation process, log on to www.gfen.info and look for the directory of participating natural gas companies and affiliated equipment manufacturer members.

