MAINE WOOD HEAT COMPANY INC

Fours depuis 1840

Le Panyol®

June 12, 2012

Dear Mr. Lecoq,

It has come to our attention that a question has been raised about the need for an exhaust hood over the door opening of a Le Panyol Model 120/130 wood-fired bake oven. All of the Le Panyol ovens have been tested and listed to UL2162, ULCS627-00 and ANSI/NSF 4 by the Omni-Test labs in Portland, Oregon. The standard installation for a Le Panyol Model 120/130 oven includes an internal stainless steel throat connected to a class A U.L. listed 8" "metalbestos" type chimney. When the damper in the chimney is open and the door is open on the oven, the stainless steel throat adaptor transitioning within the masonry core to the U.L. listed chimney acts as an internal hood with a positive draft. The shape of the dome of the oven and dynamics of the fire and smoke within the dome are fairly straightforward and very predictable. Incoming supply air comes low across the oven hearth into the oven to the fire. The fire itself pulls it because as the smoke and flame rise to the ceiling, a negative pressure is created on the floor of the oven that pulls in combustion air toward the fire. Upon initial lighting of the wood, one can easily see the layers of exhaust smoke hanging and moving across the ceiling while air near the food and oven floor stays clean with the incoming airflow. This initial observable smoke visibly defines the intake and outgoing airflows in the oven. Once the fire is established and burning hotter, the smoke exiting through the throat is virtually invisible because the system burns cleanly thereafter. The draft up the chimney itself (warm air rising) also creates laminar airflow at the entry to the smoke throat. (This laminar airflow at the throat has been extensively documented in printed and on-line writings about Rumford Fireplaces). Incoming air is not only drawn by negative pressure into the fire, but a small amount of make up air is also drawn up the front face of the smoke throat and

throat adaptor. This air serves as an air wash and keeps any smoke from spilling into the room. This air wash does not immediately mix with the hotter exhaust air that slips out the rear of the exhaust throat. A hand held infra red gun will show a significant difference in temperature on the front versus the rear surfaces of the smoke throat, indicating the presence of a positive draft and air wash at the throat. The shape and fluid dynamics of the oven core create a strong and sufficient smoke free draft based on the presence of sufficient make up air and the chimney being built to proper code height.

All wood burning appliances have a relationship between the quantity of wood they consume and the volume of air required for its combustion. Usage patterns and intensity of firing play a significant role in determining the volume of air required on a minute-by-minute basis. Based on normal usage of a commercial wood fired oven, clients may burn anywhere from 15-40 lbs of wood per hour. Average usage of our ovens for restaurants operating their ovens 10 hours per day, 7 days per week is roughly 2 cords of hardwood a month. An average cord of hardwood weighs 3600-3800 lbs dry. For estimate sake, we say that the average (2) cord consumption requires 7600 lbs of wood in a 30 day period. Each pound of wood requires 466 ft3 of air to combust. If you divide the total monthly usage weight of 7600 lbs by 30 days you find your daily wood consumption. If you divide you daily consumption by 10 hours you learn your hourly consumption. This number relates directly to your CFM calculation as well as your average BTU output. In this case 7600 lbs/ 30 days = 253 lbs of wood per day, divided by 10 hours = 25.3 lbs per hour. 25.3 lbs of wood multiplied by 466 ft3 (the amount of air required to combust one pound of wood) = 11,789 ft3 of air required per hour, per 25.3 lbs of wood. Divide this number by 60 minutes, the amount of time in one hour and you have your average CFM use or requirement. In this case it is 196 CFM per .42 lbs of wood per minute.

We have seen ovens operators push their ovens and consume nearly 40 lbs of wood in one hour, but this usage is sporadic at best and is never required once the oven has reached consistent operating temps of 600 -900 ° F. 40 lbs of wood in one hour would require 310 CFM. All of these CFM references are in relation to the amount of air required for correct combustion, they do not relate to any exhaust requirements. In the case of your oven, the model 120/130 has been tested and approved with a naturally vented Class A 8" I.D. chimney.

BTU outputs are closely tied to the volume of wood consumed within an hour of use. An average pound of dried hardwood produces roughly 6600 BTU's per hour. Given the average consumption rate of 25.3 lbs of wood per hour, we can estimate your average BTU output at around 165,000 BTU's per hour. Moisture content and size of the wood used, as well as several other factors can greatly affect combustion efficiency and thus BTU output.

We have no commercial Le Panyol oven installations where an exhaust hood has been required by code or by physical necessity. If an exhaust hood is inappropriately installed and allowed to run continuously with a forced draft, it will increase fuel consumption and lower the working oven temperatures, increase the requirements for make up air, and increase the potential for smoke spillage into the space.

If you need more information or we can help you in any way, please let us know.

Sincerely,

Scott Barden

Owner , Vice President