

## **Wood vs. Gas – What’s the better choice?**

### **What’s a stone-hearth oven?**

Stone-hearth ovens have been around for thousands of years and taken many forms. Over the generations they have been made with readily available materials, stone, clay, bricks, refractory tiles and gone by just as many different names, clay oven, brick oven, beehive oven to name a few.

Common to most stone hearth ovens are several easily recognizable features including: their shape, they have a dome or “beehive” top; their heat retaining hearth (floor) and dome made of a heavy, hard material; and usually an open cooking flame. Though the materials have changed these points continue to define the oven; in a closed chamber made of heat retaining material you burn a fuel source which simultaneously charges the hearth and dome and provides open radiant cooking heat. That’s what we call a stone-hearth oven.

Archeological digs in what is today Bulgaria suggest ovens bearing these features were used there close to 6,000 years ago. It is said 2,000 years ago there were many hundred commercial stone hearth bakeries in Rome and when Mt. Vesuvius erupted in 79 AD it entombed several “brick ovens” still visible to tourists today. Following the reformation in Europe the “Village Oven” was a common feature throughout the continent. The use of this type of oven was not, however, limited to Europe. Studies from around the world show similar ovens being used in Asia, Africa and in the Americas for many centuries, both due to indigenous inspiration and cross-culture transfer.

### **How is the type of fuel source important?**

Today there is some confusion over what role the type of fuel source, namely gas or wood, plays in the performance of the oven and the quality of the food it produces. Being a manufacturer of stone-hearth ovens this is perhaps the question we are asked most often (well, maybe second after “how much”). Our answer is always that the fuel source is not the secret of the oven; the stone hearth is the secret. Whether you use wood or gas to heat the oven makes no difference for most customers. That is our answer.

It could be said we are in a unique position to answer this question. Since our founding in 1990 we have built nearly 5,000 ovens and shipped them to almost 60 countries around the world. Today we build all kinds of fuel configuration, wood only, gas only, and several variations of gas and wood together, but the first 800 ovens we built were wood fired only. Until 1994 if you had asked us the same question we would have been diehard advocates that the “wood made it good”. Then we had a paradigm-shifting experience.

Almost simultaneously two of our key customers came to us and asked for a gas fired oven. They explained it was prohibitively expensive or impossible to ventilate wood equipment in many prime locations and training chefs to balance a wood fire could be challenging. A gas oven would allow them to open in locations previously untenable and standardize their operational training. At first we balked at their requests, seeing a gas-fired version as a form of oven sacrilege. "Wood Stone makes wood ovens," was our refrain. But pretty quickly we realized our customers' had real venting and operational challenges and needed a viable solution. We took off our fuel type blinders and put on our customer service hats. What happened next flew in the face of many of our assumptions and led us to develop a new product that has redefined our business and, we sincerely believe, is revolutionizing the foodservice

### **Building a Gas Oven**

After over a year, and more than a few attempts and restarts, we settled on a program of a dual-temperature gas oven which utilized a radiant gas flame (RFG) and an underfloor infrared (IR) burner. We found this configuration most accurately duplicated the effects of a wood fire. We purposefully engineered a yellow radiant gas flame to reproduce the intense dry heat of the open wood flame. The thermostatically controlled IR replicated the role of the coal bed in diffusing heat in to the hearth laterally below the top of the cooking surface. Now that we could reproduce the heat accurately we set to test cooking. We ran blind taste tests fully expecting the difference in taste to be immediately apparent. We were shocked with the results. Time after time the people taste testing could not tell if the food (pizza, bread, meat, seafood or vegetable) was cooked in a gas or wood oven. We brought in outside tasters, customers who had only worked with wood, again their conclusions were the same. The food coming out of the gas oven was every bit the equal of that from the wood oven.

Facing this unlikely result we forced ourselves to stop and step back from our assumptions to gain perspective. First we looked at the flavor question. Always the food coming out of the oven had been excellent and always we had cooked with wood, naturally then the taste must be linked? But now our experience was telling us a different story. A gas oven was cooking food of the same quality.

### **Breaking Down Long Held Assumptions**

Then we asked, "how exactly does a wood flavor get into the food?" Looking at it free of our assumptions we realized there were only two ways that food can be infused with wood flavor and both involve direct contact. The first is by direct contact between the food and the wood. While there are techniques like planking which utilize this option, it is not the norm and would not account for the broad taste difference most people expected. The second method would be through direct contact between the food and the smoke. This is what occurs, for instance, in a smoker, or over a wood grill. But in an oven the environment is different. You are not cooking over the wood in the path of the smoke. In most circumstances you cook to the side, on the floor at the same level as the wood. To illustrate this point we often remind people of an early lesson we all received. What do parents and teachers say to do in a fire? Invariably some form of "get as low to the floor as possible." Why? Smoke rises. Smoke behaves no differently in an oven. The food is on the hearth and the smoke rises above it and then is vented out the stack. In almost all applications there is no contact between the food and the smoke. Does that mean that the great flavor is a figment of our imagination? No, not at all. Instead it means the great flavor present is not the result of wood as the fuel source. Then where, you might ask, does the unique flavor come from? We offer it is the stone itself.

Stone hearth ovens create a unique and wonderful flavor through their use of an open flame, the intense heat it generates, and direct contact between dough products and the hearth. The brilliance of the open flame and the stored heat in the floor and dome create an intense cooking chamber which caramelizes natural sugars in the food unlocking waves of natural flavors simply inaccessible when using other types of ovens. When you see the “fire-kissed” color that is evidence of the caramelized sugars and it’s just as easily achieved in the gas oven as the wood. When cooking dough products directly on the hearth another phenomenon also occurs. The direct contact generates a special type of “lift” to the dough which makes it better than any sheeted or panned product and puts it in a different class than those baked by air in a conveyor.

We have learned through our extensive experience that when people talk about the special “wood-fired” pizza that in fact the characteristics they describe, the caramelization of natural sugars, the color, the bake of the dough, are present in both gas and wood fired versions. It is the stone hearth and the open flame that is the secret, not the fuel source. The choice of wood versus gas then should be seen simply as a fuel choice. What’s most readily available? What will be the most convenient source? That is the relevant question.

### **Important Considerations About Wood Ovens:**

**Wood suppliers.** In order to execute a wood oven program you must find a ready and reliable supply of quality wood. In certain areas this is easy, in others it can be quite challenging. What in Washington state may be a simple process of looking under Wood Purveyor in the phone book becomes in Saudi Arabia the challenge of finding an international supplier, a willing importer, and a commitment by all involved to making sure the product meets all applicable international regulations.

**Wood quality.** This is the most often overlooked component. In a wood fired oven you will succeed or fail based on the quality of the wood. Remember that most people selling wood sell it to heat homes, not to cook with, and those are very different goals. Wood quality means two things. One is that the wood is a good, heavy hard wood. At 15-20% moisture content 1 pound of wood produces about 7000 BTUs. Oak weighs about 4600lbs per cord, birch 3000lbs. Obviously you will get many more BTUs per cord with Oak. The second component of quality wood is moisture content. Ideal is an interior content of 15-20%. If you have wet wood, over 20%, you waste BTUs boiling water out of the wood and in doing so sacrifice your open flame. You can always tell when customers have wet wood, their oven is very dark. They have good coaling and the floor is hot, but there is very little open flame and this handicaps the top heat necessary to balance the bake.

**Wood storage and ash disposal.** Once you have found a supplier and determined that they can reliably give you quality wood then you need to find a place to store it. A cord of wood is 4’ x 4’ by 8’. It needs to be covered to stay dry, but the majority should also be outside the main building to avoid harboring any pests. After burning the wood you will need to dispose of the ash. That requires some space and the proper tools. It is highly recommended that an ash dolly be purchased with the oven to avoid dumpster fires.

**Ventilation.** Wood ovens, or any using solid fuel including coal, need to be vented independently of other pieces of cooking equipment. In a single story building this can be a simple task, in a 20-story downtown high-rise this can be an expensive adventure.

**Cleaning.** In addition to cleaning the ash, it is a must to regularly clean the ductwork above the oven. It will vary from operation to operation, and due to wood quality (20% moisture content wood produces twice the creosote of wood 15%) but a good estimate is a cleaning once every month or once every other month.

**Operation.** Operating a wood fired oven is not brain surgery, but it does require the operator to be a fire-tender first and a chef second. With a wood oven you need to place a new log on the fire every 15-20 minutes otherwise the oven temperature will fluctuate. Add to the equation wet, poor quality or odd sized wood and this task becomes more magic and less routine.

### **Important Considerations About Gas Fired Ovens:**

**Supply and quality.** Essentially a gas supply is a gas supply. Once evaluated and connected it stays the same from one day to the next and is always on demand.

**Operation.** With a gas oven the chef is a chef first and foremost. You adjust heat by turning the radiant flame up or down, much like a sauté flame any cook has operated. Log placement, special timing or fire-savvy is not required.

**Ventilation.** The gas-fired oven can be vented like any other gas piece of equipment. That means it can go under a shared hood or share its exhaust with another grease duct.

**Cleaning.** The hood or duct over the gas oven is like that over any other cooking equipment and therefore can be scheduled at the same time.