

ROASTERS REALM

BY CHRIS RYAN

Profile roasting's minimal impact



CLASSIC GOURMET COFFEE'S facility in Concord, Ontario, uses a profile roasting system that helps reduce gas consumption and CO₂ emissions by 59 percent.

John Rufino has been roasting coffee since the mid-1970s, but it wasn't until the early-2000s that he feels he reached his roasting potential. In 2002, Rufino purchased an advanced roasting system with controllable profile roasting. With the machine as the centerpiece of his business, he launched Classic Gourmet Coffee in Concord, Ontario, near Toronto. He crafted a roasting facility that focuses on both high-quality beans and minimal environmental impact. Here, Rufino discusses his roasting background, how he built his roastery and chose his machine, and why he wanted to go green.

Q.: How did your roasting career begin?

A.: In 1974, I purchased my first roaster; it was a 10-kilogram, traditional-batch roaster made by a European manufacturer. Before I knew it, I found myself in Italy to obtain a more intense understanding of the roasting process. When I returned to Canada, I tried to re-create what I had learned. After a few months of lessons and continuous experimentation, I was able to create coffees I was proud of. I later purchased a 60-kilogram roaster, but a childhood dream persisted. So in the late-'70s, I made a decision to return to school. I graduated as an electrical

engineer and worked in that field for a few years. But my passion for coffee and a yearning to create brought me back to the coffee industry. In 1986, I bought a 120-kilo roaster, and my quest for the perfect cup started again.

Q.: How did your understanding of roasters evolve?

A.: Although I understood the roasting behavior of different coffee types, the need for dedicated roasting processes and the necessity of replicating each process, it was impossible to achieve consistent results without some form of technology. As time went by, I was feeling more and more the need for better control, more reliability and a consistently better cup of coffee.

In 1995, I began to look at new roasting systems. After several trips to Europe and countless phone calls, I was able to locate one. The new system intrigued me because of all the roasting controls and for its ability to reduce fuel consumption and consequently reduce emissions. I was ecstatic to finally own a system that would enable me to produce a high-quality and consistent product, while being economical and environmentally friendly. The stress associated with trying to maintain a high

level of consistency through every batch, no matter the capabilities or years of experience, was eliminated.

Q.: When did you start Classic Gourmet Coffee?

A.: In 2002. That's when I sold my other company, and I sold the roasting system I had bought in 1995. I purchased a much more advanced system with more controllable profile roasting, re-circulation of heat and gases, vacuum transportation through stainless-steel tubing, filtered air exhaust, stainless-steel enclosed storage silos and green coffee cleaning (including separation of low-density beans—i.e., floaters).

With more than 30 years experience in the specialty coffee industry, it was my pursuit to build a state-of-the-art, environmentally friendly roasting facility capable of producing the most exceptional coffee on the market. Although there is an art to roasting, which is driven by passion, science has indeed unlocked the mystery of coffee. Technology has allowed us to control the many factors that affect the final product.

Q.: Can you define profile roasting in a nutshell?

A.: At its heart, profile roasting is using technology to carefully control each step of the roasting process. The countless hours spent at the cupping table to select the best coffee is only a small part in the task of producing an ideal cup. Many complexities already exist within the bean (in its natural state), determined by moisture, density, preparation, etc. Then there are the chemical and physical changes that take place during the roast process as a result of heat being applied to it. Different reactions occur at varying temperatures throughout the roasting cycle. By precisely controlling the temperature, we are able to control the changes that take place. Once we determine the ideal parameters for specific coffees, we can repeat the process over and over again; each single origin, blend and roast level has a dedicated roasting profile. While the color of the bean is determined by the final roast temperature, the overall quality of the roast is determined by the journey (profile) of the beans throughout the roast cycle.

Q.: What are some of the specific technologies you're utilizing?

A.: Our system incorporates two independent PID controllers. One controller acts on the burner by modulating the flame as a response to the heat energy required. The second PID gauges the bean temperature and consequently acts on the air flow to increase or decrease the temperature in the roasting drum, ultimately ensuring that the set profile is satisfied. When an increase in heat is required in the roasting drum, the air flow is increased, and as a result the flame from the burner is increased. As a roast cycle progresses, the demand for heat diminishes to the point where air flow is at a minimum; this is sensed by the burner controller, and the flame diminishes and eventually turns off. Meanwhile, the heat necessary to complete the roast is supplied by the exothermic reaction of the coffee being roasted and by heat stored in the equipment mass.

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Q.: Now that you're used to this technology, can you imagine roasting on a conventional system now?

A.: After roasting with such an advanced system, reverting back to a traditional system would be like walking in the dark. You need to use your senses to guide you through the process. The same level of quality and consistency is difficult to achieve.

Q.: What effect does your roasting system have on the environment?

A.: In addition to creating a great cup of coffee by profile roasting, our system allows us to reduce gas consumption and CO₂ emissions. By means of the recirculating system, we are able to regain part of the heat energy. The hot air from the roasting drum is conveyed into the flame of the roasting burner and then back into the drum. During this process, the combustion byproduct is burned away by the flame. By using this system—which does not require an afterburner—we are able to reduce our gas consumption by 59 percent and consequently reduce our CO₂ emissions by the same amount (in comparison to a traditional system of the same capacity that employs an afterburner of the same size as the main roasting burner). If it were compared to a traditional system—which typically uses an afterburner three times the size of the main roasting burner—then the consumption and emissions would be 77 percent less.

Q.: Beyond the roaster, how is the roasting facility environmentally minded?

A.: In our assessment of the environmental impact of our coffee roasting facility, we have first and foremost taken all measures to retain and enhance coffee authenticity and quality. However, in so doing, our impact on the environment takes precedence. Although gas consumption and carbon emissions are greatly reduced by our

roaster, it's not exclusive of the impact of additional equipment and materials used in our facility. In preference to a conventional painted steel installation, we opted for a stainless-steel system. Storage silos and conveyors for both green and roasted coffee are made of food-grade stainless steel. The molecular structure of stainless steel makes it less porous than any other conventionally used steel. The less porous surface eliminates the absorption of coffee oil that eventually turns rancid and compromises coffee taste. Furthermore, the chemical composition of stainless steel does not allow any reaction from the moisture emitted by green

(raw) beans, eliminating any possibility of rust buildup on the interior surfaces.

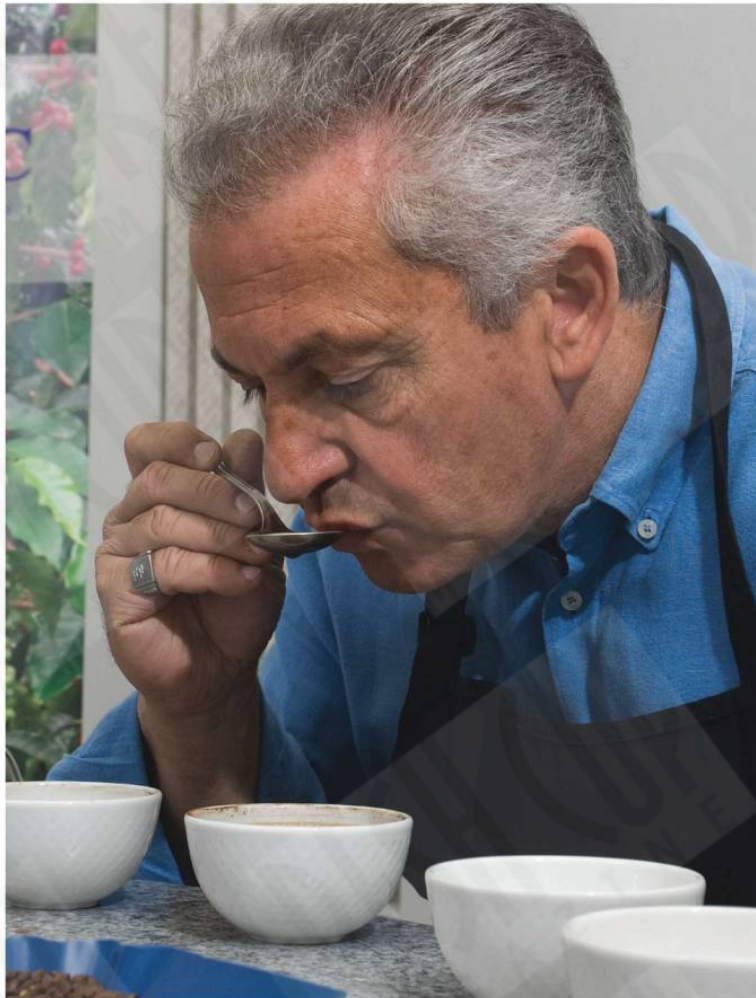
Although our facility is currently powered by conventional electricity, we are currently in the process of converting to a renewable electricity source. Green power, of course, reduces carbon emissions and will further reduce our carbon footprint. Our commitment to the environment and sustainability extends to packaging materials and other products required in our facility. When they are available, we use recyclable, chemical-free items purchased locally.

Q.: How do you feel about the impact you're having?

A.: We are proud that we have taken a leadership role in producing exceptional coffees while reducing our environmental impact. Although our current initiatives have con-

tributed to the reduction of carbon emissions, our commitment to sustainable practices and quality coffees will continue to drive us.

Gas consumption and CO₂ emission values were calculated from data obtained from tests by Dr. Jacob Friedman, associate professor, department of mechanical engineering at Ryerson University in Toronto. ☛



JOHN RUFINO has been roasting coffee for more than 30 years, and his Classic Gourmet Coffee roasting facility achieves the dual goals of producing high-quality coffee while having a minimized environmental impact.

COURTESY OF CLASSIC GOURMET COFFEE