HotTop

COFFEE ROASTER

Getting the Most From Your Hottop Roaster

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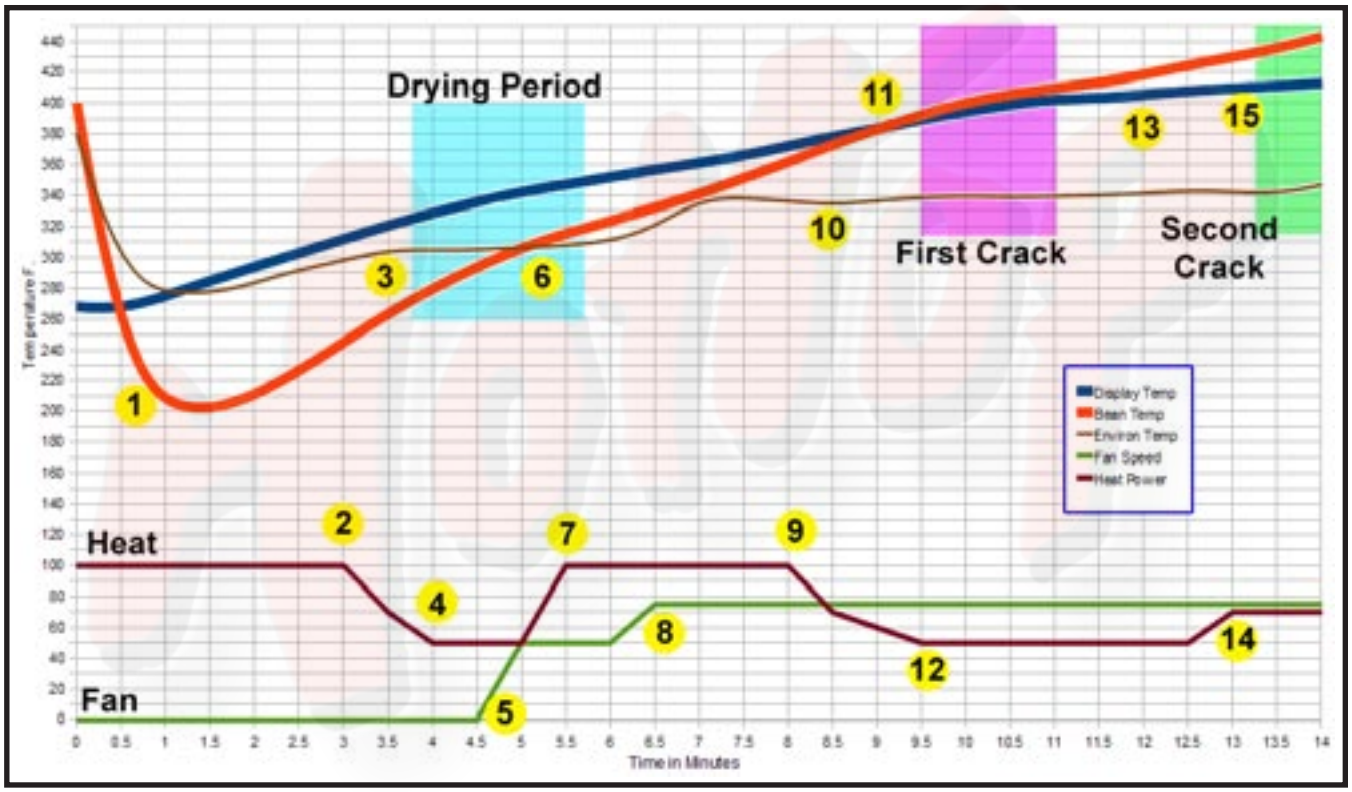
Getting the Most From Your Hottop Roaster

Over the years, roasting theories concerning profiles have changed. A lot of that has been driven by the amount of control the user has over the appliance they are using. Up to this point there have been few home commercially-available roasting devices that allow the home user to control the roaster precisely. The "B" model Hottop roaster changed that. While this article is aimed at the users of the "B" model, owners of the "P" model, and other rosters as well, will benefit from the information here.

During the roasting process the coffee undergoes a number of dramatic changes, and if the user pays close attention, these changes will act as indicators and allow you to more-precisely control the roast. The beans go through a number of color changes and even changes in their size. Chemically, certain elements in the bean are changed, and at one point near the end of the roast the beans are actually *creating heat energy*! As you become more familiar with those changes you will be able to predict what you need to do. As with all electrical heating devices, there is a bit of lag time between making a change in the heating level and the actual change in the environmental temperature, and the knowledge presented here will help you predict when to make changes using the control panel of the Hottop Coffee Roaster.

Refer to the following graph and read along, Highlighted red numbers in text "(1)" refer to the black highlighted numbers in this graph:



In this graph, the **Blue** line is the Display Temperature. This data was taken from the LED display on the KN-8828B-2. That is the temperature which you will refer to when roasting if you have not equipped your roaster with after-market, additional temperature monitoring devices. The other temperatures are from an after-market digital thermometer added to our test unit for the purpose of gathering the information for this graph. The **Red** line is bean temperature from a probe in the bean mass itself, and the **Brown** line is a thermo-sensor in the hot air, in the drum, near the top of the roasting chamber. "Time" started when the beans were added to the roaster. Note that all times and temperatures are for general reference only. Slight changes in the location of a temperature sensor can have dramatic changes in the displayed temperature. Your results will vary depending on various factors such as bean moisture level, air temperature, voltage supplied to the roaster, amount of beans being roasted, condition of main filter, etc.

The roast used for the graph was done by programming the "B" model Hottop Roaster for maximum time (25:00) and maximum temperature (428 F.). Many users have experimented with the temperature at which they add the beans to the roaster. In this roast the beans were dropped in at an indicated temperature of approximately 265 F. on the Hottop's display (1), as the **red** line indicates. Try waiting until the display shows 250 to 275 F. and see how that works for you. The amount of beans used also will affect the roast. To begin with we recommend using 250 grams. You may experiment later with 225 to 235 grams to see how this affects the roast, and most importantly, the flavor. Smaller amounts of beans will speed the roast.

Remember that coffee is a food product.
The most important factor is
***HOW THE COFFEE TASTES TO YOU*!!**

After you add the beans to the roaster they begin to absorb heat energy, transferred to them by convection (exposure to the hot air), conduction (through the hot metal of the drum), and to a lesser degree radiation (radiant energy from the heating element). That is why red line in the graph drops at the beginning.

When the display temperature reaches around 300 F. (2) the beans are about to enter the important drying phase, indicated by the **light blue** box. Watch through the observation window on the front of the roaster and you will see the beans change to a green color. Moisture in the beans is being removed and you might begin to notice a pleasant, grassy smell somewhat reminiscent of a freshly mown lawn.

At this time it is important to allow the beans to lose their moisture throughout their structure. This insures that the entire bean roasts evenly as the temperature rises later in the roast. Rushing through the drying phase may roast the outer areas of the beans sufficiently, and the beans can look fine, but the inner portions on the bean can be left at a lesser roast level causing unpleasant tastes in the cup.

To control the drying phase, when the roaster reaches 280-290 F., turn the heating element to about 70% (three steps down). The goal is to hold the temperature inside the roasting chamber relatively steady while waiting for the beans to catch up (between 3 to 6). When the roaster hits about 310 to 320 F. turn the heating element to 50% (4). The fan will help clear humidity from the roaster which is coming from the moisture inside the beans as well as assisting in stabilizing the temperature, so set the fan speed to 25%, or even 50% depending on the condition of the Main Filter (5). The goal here is hold the temperature in the roaster to between 300 and 325 F. to allow the temperature of the beans to try to catch up with the environmental temperature.

Note that when the heating element was turned back up to 100% (7), it took some time for the temperature in the roasting chamber to rise as seen in the portion of the **brown** line between (6) and (10). As mentioned earlier in this section, this is normal for an electrical heating element.

Keep in mind that while attempting to hold the temperature steady, it is better to allow it to rise slowly than to drop. If the temperature in the beans is allowed to drop during the roast it can lead to undesirable results. Keeping the display temperature rising slowly during the drying phase will assure that the beans are safe. As you get more experienced in use of the controls of the Hottop Coffee Roaster you will be able to more precisely control the temperature.

All this time you should keep an eye on the beans. They will go from light green to an amazing bright green color. This marks the height of the drying phase. The bright green will begin to fade and they will begin to turn tan in color. Around the time that the green color is beginning to fade it indicates that the beans themselves are in the vicinity of 300 F. (6). This is the time to turn the heating element up to 100% again (7). Shortly after that the smoke will increase and it is time to turn up the fan (8). The display will show a higher temperature as indicated on the graph above- that is normal. Note that the bean temperature is starting to catch up with the display temperature.

Over the next four minutes or so the temperature of the beans will continue to rise and the tan color begins to darken towards cinnamon and then brown. Watch carefully. At an indicated display temperature of around 360 F., the display temperature will closely match the bean temperature as their temperature plots cross. This is a time when things are happening quickly.

At around 350-365 F. an adjustment should be made. To keep the beans from going through the end of the roast too quickly, it is time to turn the heating element down (9). Notice that even though the heating element has been turned down, and the graph's **brown** line, indicating the environmental temperature, has leveled off (10), the bean temperature is still rising! Just as you are entering first crack (11), indicated by the **purple** box, there is a chemical reaction going on in the beans called the Maillard Reaction. Chemical changes in the beans are actually creating heat- the beans are becoming exothermic. The sounds of first crack, reminiscent of breaking small wooden sticks, begins with a few clicks and then increases in frequency. As first crack becomes more active, the heating element should have already been turned down to around 50% (12). Depending on how things are going you may need to turn the fan up as well.

Another change you will notice is that the beans are expanding. That is where the sounds of first crack come from. You will observe that the level of the beans in the roasting chamber has risen against the glass. They expand so much that they emit that distinct cracking sound.

The roast is nearing completion, and you are just minutes away from ejecting the beans. First Crack is about to end at about an indicated 400 F. If you have done well up to this point, from the end of first crack to the beginning of second crack you should have a pause of about two minutes (13). The exact length of time does not have to be precise, but if you get about 1:30 to 2:00 minutes lull time between those two periods you are doing a pretty good job.

As you can see, this roast slowed a bit too much so the heating element was turned back up to 70% (14). This example is offered because it is important for you to realize that you shouldn't hesitate to make adjustments other than those specifically described in this section. The goal of this section is to give you a better understanding of what is happening so you can control the process. Much like trying to write an article on how to fry an egg, it is easy to tell someone to raise the pan to control the temperature of the pan as well as what to watch for, but difficult to tell them exactly how high to raise the pan on the burner- learning that is best accomplished by experience.

Notice that even though you have turned the heating element's power down to half, the temperature continues to rise. Listening carefully and you will begin to hear the first few clicks of second crack. These sound like breaking toothpicks (15). Second crack is indicated by the **green** box. It will start just like first crack, with a few stray clicks, and then turn to a rapid series of those same sounds. If the frequency of the sounds decreases be wary. This is the time when coffee is becoming so dark that it can lose a lot of its flavor. When the beans look oily or greasy, five seconds is a long time in the life of a roasting coffee bean. Even though the graph line of the display temperature is now beginning to flatten, the bean temperature continues to rise as second crack progresses (15).

This is the time you need to decide when to hit the eject button to end the roast. But when? There is no one answer. When to end the roast depends on the coffee you are roasting and how it will be brewed, and most importantly, your preferred taste. For Colombian coffee brewed as drip, I would recommend trying a lighter roast than you may be accustomed to. Maybe hit eject after about the first ten clicks of second crack, or maybe even predict second and eject the beans a minute before second crack starts. For an espresso blend, try ejecting about ten seconds after second crack becomes active.

Over time, if you experiment with various roast levels you will be surprised at how the taste changes depending on the various changes you make during the roast. Experiment! Don't be afraid to try some lighter roasted coffee. Try to vary the drying time- longer or shorter. Try shorter or longer time periods between first and second. Each of these changes will change the taste of the coffee- sometimes for the better, sometimes not.

Be aware that as a general rule, the lighter the roast, the more the coffee benefits from a post-roast rest period before first use. Some coffees actually benefit from a ten day rest, but about two to four days is usually sufficient for most coffee.

Roasting coffee is part science and part art. We hope this section gave you a better understanding so that, over time, you can use this knowledge to become a coffee roasting artist.