MOBILE GLASSBLOWING STUDIOS: FAQ

We welcome you to contact us at any time if you have questions!
229-352-9988 or mobileglassblowingstudios@gmail.com

OPERATION

Q: Is there anything special I need to know about lighting my Dragon or Phoenix for the first time?
A: The initial fire-up of your furnace should go as slowly as possible and be conducted with good ventilation (this varies by studio environment; please consult with a certified HVAC professional to understand your specific needs). We oven-cure all refractory parts after they are cast, but there is still some natural off-gassing of the refractory that takes a few hours to clear out once the flame is running. You should refer closely to your Owner's Manual for the recommended sequence. We also encourage our clients to contact us just before the initial start-up. We are happy to help walk you through everything.

Q: How do I light my furnace?
A: Generally speaking, our standard furnaces are manually ignited using a handheld MAPP gas torch. Specific furnace and safety system configurations will affect your ignition process sequence. Please refer to your Owner's Manual or download a copy here. You should not attempt to light a furnace without first referring to the Manual. If you need further assistance, please see our Customer Support options.

Q: How do I know my furnace is getting hot enough?
A: Heat up times depend largely on your surrounding environment (indoors/outdoors, etc.), starting temperature on the inside of the furnace (was it fired yesterday?), quantity of glass you are trying to melt, and flame settings. We designed our furnaces to be manually operated, so we recommend taking a gather periodically after the first couple hours to check the viscosity of the glass. The approximate heat up times for workable, bubbly glass are: Mini Dragon: 3 hours; Baby Dragon: +/- 3 hours; Little Dragon: 4-5 hours, Big Dragon: 6-8 hrs; Baby Phoenix: +/- 4 hours; Standard Phoenix +/- 4 hours. Note that the optional preheat hose will extend the length of heat up time.
You can also purchase an optical pyrometer if you wish to have more quantifiable data regarding the furnace temperatures.

Q: How long should it take for my Dragon to get hot (to good working temperature)?
A: The **approximate** heat up times for workable, bubbly glass are: Mini Dragon: 3 hours; Baby Dragon: +/- 3 hours; Little Dragon: 4-5 hours, Big Dragon: 6-8 hrs; Baby Phoenix: +/- 4 hours; Standard Phoenix +/- 4 hours. Heat up times depend largely on your settings, starting temperature on the inside of the furnace (was it fired yesterday?) and quantity of glass you are trying to melt. Note that the optional preheat hose will extend the length of heat up time. See the GLASS section here for information on how to reduce the presence of bubbles in your glass.

Q: My furnace doesn't seem to be getting hot enough. What can I do?
A: As our furnaces are manually operated, it can take a little practice to get the flame dialed in. A proper mix of gas to air is necessary for a balanced flame. A few things to check:

1. Be sure that your burner tip is properly placed as described in your Owner's Manual.
2. Refer to the Flame Adjustment section of your Owner's Manual.
3. If you are still having problems, please feel free to contact us.

Q: What do I need to know about running my Dragon or Phoenix overnight?
A: If you are planning to run your furnace overnight, you'll need an ample fuel supply and the Proof of Flame safety system. For extended use, fill it up with glass and bring the furnace up to temperature slowly. Once hot, you can lower the temperature overnight, and raise it again in the morning. This is a good way to get a glass melt that should have fewer bubbles.

Q: What happens if I lose power while my furnace is running?
A: All standard furnaces come equipped with an electric solenoid shutoff valve which will stop the flow of gas when power goes out. Turn off the gas valve on the burner system and then close the propane tank knob. If you can restore power within about 5 minutes, re-light your furnace according to your Owner's Manual instructions. If it is a more complex issue, carefully rotate your burner train with Kevlar gloves to keep your burner tip away from the heat while you resolve the problem.

Q: How do I change the program on my annealer controller?
A: You can add or change a program on the Arrow Springs controller by following the instructions on the information sheet provided with your controller. You can also download their manual here. If you are using a different controller, you'll need to consult the manual or manufacturer website for their specific operating instructions.

GLASS

Q: What kind(s) of glass should I melt in the furnace?
A: We recommend soda-lime (soft glass) nuggets or cullet. Cristalica, Kugler, Bomma, and System 96 all work really well in our furnaces. Recycled cullet can also be used, such as soda or beer bottles. Note that the smaller the pieces of glass being charged, the more bubbles they will tend to produce. Our furnaces are NOT made for borosilicate glass.

Q: Can I melt batch in the furnace?
A: Yes, you can! Melting batch takes more heat and time than melting cullet (generally overnight is best), so we recommend the larger Dragon Furnaces for this operation (Little Dragons & Big Dragon). The furnace needs to be preheated to melting temp (approx. 2300 degrees F) prior to charging the batch in approximately 12-pound increments. Allow the batch to melt flat before adding the next charge. Proper ventilation and safety gear is recommended. Consult your batch supplier for specifics.

Q: What can I do to get better glass quality (fewer bubbles)?
A: Melting glass is an art, and it takes practice and ultimately time in the furnace to fine out bubbles. There are many factors that affect glass quality, including size of cullet, number of times the cullet has been melted, dust on the cullet, the speed at which the glass is heated, furnace size, and flame settings. Running a furnace for multiple days (and overnight) may yield better results in glass quality. Washing your glass before charging may also help. Using fresh nuggets vs. recycled cullet can also be a factor. Even when using recycled cullet, we've found that using some percentage of fresh nuggets (compatible, of course) may also help with glass quality. Ultimately, keeping detailed notes on your melting processes is crucial to get your specific systems dialed in.

Perfectly clear glass is also not a necessity for everyone. If you make work that has frit or powder on the outside, or if you are primarily practicing or doing hands on workshops, bubbles may not matter. Many people enjoy the aesthetic of bubbles!

Q: How and when do I charge the furnace?
A: Before you light your furnace, fill your crucible with nuggets and/or cullet. Once the glass is loaded, follow the procedures in your Owner's Manual for lighting up the furnace. After a couple hours, you can charge more glass if you'd like.
Charging while working can also extend your session if needed. For example, many Mini Dragon owners have tailored their schedules to charging mid-day before lunch, so they get more working time out of a session. It can take anywhere from 30 minutes to over an hour to melt in the added glass, depending on the size of your crucible, how much glass you add, and the strength of the flame.

Q: What do I do with the leftover glass at the end of my working session?
We highly recommend removing most of the remaining glass from the furnace when you are done. You can use a blowpipe, punty, or gathering ball to gather the glass out or use a Ladle for a more efficient process. Leaving an inch or two in the bottom of the crucible is perfectly fine. Any more than an inch or two can be irreparably damaging to your crucible. The ladled-out glass can be used as cullet to melt again later.
When ladling out your furnace, we recommend the following:

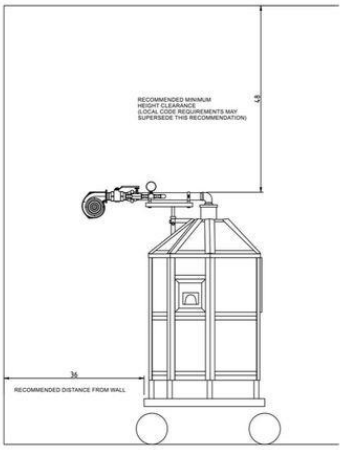
1. Have a large, stainless steel bucket available to dump the glass into. If there isn't existing cullet in the bucket already, put a few inches or so of water in the bottom of the bucket. If there is cullet already in the bucket, spread it out into a shallow dish shape to hold the molten glass you'll be ladling out. If this fresh glass rests on the sides of your bucket, it can stick to the steel!
2. Turn off the gas to the furnace, but leave your blower running. The glass will still be plenty molten enough.
3. Dip your ladle in cool water (we like using our pipe cooler for this), then scoop out what you can from the furnace. You may at least want a glove for your front hand. Dump it quickly into the waiting bucket, then quench the ladle in water again. You may want to leave your ladle in the water for a minute to really cool it off. The more the ladle heats up, the more likely the glass will want to stick to it.
4. Repeat this process until you have a couple inches at most of glass in the bottom of your crucible.
5. It can be helpful to have an assistant to open & close the furnace door for you in between scoops.

STUDIO SETUP

Q: What kind of ventilation do I need for my studio?
A: Glassblowing furnaces need to run in a well-ventilated area. There are potentially dangerous by-products released when operating any kind of gas combustion system. Every studio environment is different; therefore, we highly recommend that you consult with a certified HVAC professional as a part of getting your studio set up in the right way for your space. We do not consult on ventilation specifics.

Q: How much square footage do I need to run the furnace?
A: The assembled furnace dimensions are as follows (note that this does not include space needed for bench(es), annealer(s), etc., as every configuration is based on personal preference and way of working).

- Mini Dragon: 4’ D x 4’ W x 6.9’ H (Metric: 1.22 D x 1.22 W x 2.1 H)
- Baby, Little or Big Dragon: 7.5’ D x 4’ W x 6.5’ H (Metric: 2.29 D x 1.22 W x 1.98 H)
- Double Baby or Double Little Dragon: 7.5’ D x 7.5’ W x 6.5’ H (Metric: 2.29 D x 2.29 W x 1.98 H)
- Phoenixes: 56" H x 31" W x 60" D (Metric: 1.43 D x .79 W x 1.52 H)



FUEL

Q: How much fuel does each furnace use per hour?
A: Fuel consumption will vary based on many factors including fuel type (propane or natural gas), specific burner settings, and whether you are running a preheat hose. The following numbers are approximations. For more detailed information on fuel comparison, please see the Elgas blog Fuel Comparison and LPG Conversion articles.

- Mini Dragon: Propane: +/- 0.5 gallons or +/- 1.5 kg per hour; Natural gas: +/- 6 cubic ft or 1.93 cubic meters per hour
- Baby & Little Dragons: Propane: +/- 1 gallon or +/- 3 kg per hour; Natural gas: +/- 12 cubic ft or 3.86 cubic meters per hour
- Big Dragon: Propane: +/- 1 gallon or +/- 3 kg per hour; Natural gas: +/- 12 cubic ft or 3.86 cubic meters per hour
- Phoenixes: Propane: +/- 1 gallon or +/- 3 kg per hour; Natural gas: +/- 12 cubic ft or 3.86 cubic meters per hour

Q: What size propane tanks do I need to run my furnace?
A: The Mini Dragon will run for a day or more on a small 5-gallon “BBQ” tank. However, these can tend to freeze up (you’ll see frost on the outside of the tank and may notice the flame beginning to fluctuate a bit). This can compromise your flame consistency, and ultimately, the working temperature of the furnace. We recommend having at least two tanks on hand so you can switch back & forth as one freezes. Or you can use a 12-gallon (40 lb) tank over multiple days with fewer freezing issues. Alternately, you can purchase an electric Power Blanket specifically designed for propane tanks to avoid freezing.
The Baby, Little and Big Dragons, and the Phoenixes, are best run on at least a 23-gallon (100 lb) tank. Again, we recommend having more than one available in case of a tank freezing up during your working time.
Please note: Gas pressure can sometimes fluctuate when a tank is running low, even if it’s not freezing up.

Q: How do I properly switch propane tanks while my furnace is running?
A: First, be sure that you have your adjustable wrench ready. Shut off the connected propane tank by turning the knob on top of the tank clockwise until it stops. Close the gas valve on your burner system. Leave your blower running. Using your adjustable wrench, disconnect the gas feed from the propane tank, and attach it securely to the new propane tank. Follow your normal light-up procedure as outlined in your Owner’s Manual. Once the propane is re-lit, adjust the gas valve on your burner system to get the flame dialed back in.

MAINTENANCE

Q: How do I take proper care of my burner tip?
Many people don't realize that the burner tip is a delicate part of their furnace setup! While it does help to project your 2,000+ degree flame, it is still a component that requires some care to keep it intact for the lifetime of your furnace. We recommend taking the following steps to care for your burner tip:

1. After emptying your furnace and shutting off the gas, leave your blower running until the burner tip is cool to the touch.
2. Always detach your burner train to transport your furnace. The jostling from moving, loading, transporting, or unloading the furnace could cause chips and/or cracks, which can compromise the integrity and functionality of the burner tip.
3. Wrap the completely cooled burner tip securely in bubble wrap and/or a heavy towel any time you are transporting it. Our Accessory Cart is also a good way to easily and safely store and transport your burner train and the other detachable accessories from the furnace.
4. We recommend having a spare burner tip on hand. We do stock replacement burner tips; please contact us for current pricing and shipping rates.

Q: What happens if I see cracks in the crucible or the inside of the furnace?
A: As this equipment is subject to extreme temperatures and temperature shifts, dependent on use, there will be wear and tear on the refractory, including the development of small cracks over time. This is normal and expected and will not affect the functionality or durability of the equipment. The crucible is backed up with 2" of high strength castable and should function perfectly for years to come even after development of small cracks. Note that if you are rough on your equipment (for example, heating it up overly quickly, moving it around while very hot), it may start to degrade sooner.

We can replace crowns and crucibles as needed – please see our Support page for more details on routine maintenance options.

Q: What maintenance is needed to prolong the life of my Dragon or Phoenix?
A: Our furnaces are designed to require minimal maintenance. Be sure to properly care for your burner tip, and only move your equipment when it is cooled off. Like any piece of equipment, the gentler you are with it, the longer it will last. We can provide routine maintenance as needed such as crucible replacement. Please see our Support page for details on options.

Q: How do I replace my crucible?
A: The rebuild is a weekend project. The top half of the furnace lifts off (with the help of an engine hoist) and the crucible and casting are excavated. A new invested crucible is put in its place, a ring is cast and the top half is lowered back on and bolted together. You can contact us to purchase an invested crucible, or see our Support page for information on routine maintenance services.

MISCELLANEOUS

Q: When should I wear safety glasses in my glass studio?
A: Always!! Whether you are lighting the furnace, blowing glass, ladling out at the end of the day, or anything

in between, protecting your eyes and general safety should be first and foremost.

Q: How can I tell the temperature of the furnace?
A: We designed our furnaces to be manually operated (they become pretty intuitive over time), so we recommend taking a gather periodically after the first couple hours of heat-up to check the viscosity of the glass. You can also purchase an optical pyrometer if you wish to have more quantifiable data regarding the furnace temperatures.

Q: What's the best way to transport my furnace for demos, events, etc.?
A: For a variety of safety reasons, your furnace should be transported only when it is cool. Even though the casters have brakes, securing the furnace and all other equipment with ratchet straps, ropes, chains, etc. is highly recommended (note that ratchet straps can melt if the furnace is hot). Some things to keep in mind:

1. Carefully detach the burner train and all other detachable accessories before moving the furnace. Use Kevlar gloves if components are still hot.
2. Be sure to follow best trailer load distribution practices. For more information, check out Uhaul's informational video.
3. If there are any plastic components inside your trailer (or if it is rented), let the furnace cool off as much as possible to avoid possible melting or damage of trailer components due to heat exposure. Some folks have had to learn this the hard way! As previously stated, your furnace should be cool before moving it.
4. Some people prefer an open trailer, some like a closed one better. This is really a matter of preference. The Mini Dragon can fit into the back of a pickup truck or even a RAV-4! Note that an open trailer may expose your equipment to rain, snow, etc. This will not compromise the functionality of your furnace but may cause rusting and could affect your annealer and/or burner system. You'll need to do research to determine what is best for you.

Q: How long do I have to wait to move a hot furnace?
A: It is ideal to wait as long as possible before moving your furnace.

Q: What kinds of work can I anneal with the CAT-60? How thick can it be?
A: The CAT-60 is designed to anneal ornaments and simple cups in about an hour. Ideal thickness would be around 1/8 inch (.32 cm). A note about ornaments: we recommend leaving a tiny hole between the hook and the body of the ornament, so a vacuum is not created by sealing it off completely. This allows for more even annealing and a more stable object (though they will collect water if hung outdoors).

Q: How many amps does the furnace pull?
A: The blower for the furnace pulls 1-2 amps, depending on your specific safety system configuration. Be sure to check the available circuits at your location for optimal setup. Plugging your blower and annealer into the same outlet could overload a circuit.

Q: How many amps does the annealer pull?
A: The annealer uses 14 amps. Be sure to check the available circuits at your location for optimal setup. Plugging your blower and annealer into the same outlet could overload a circuit.