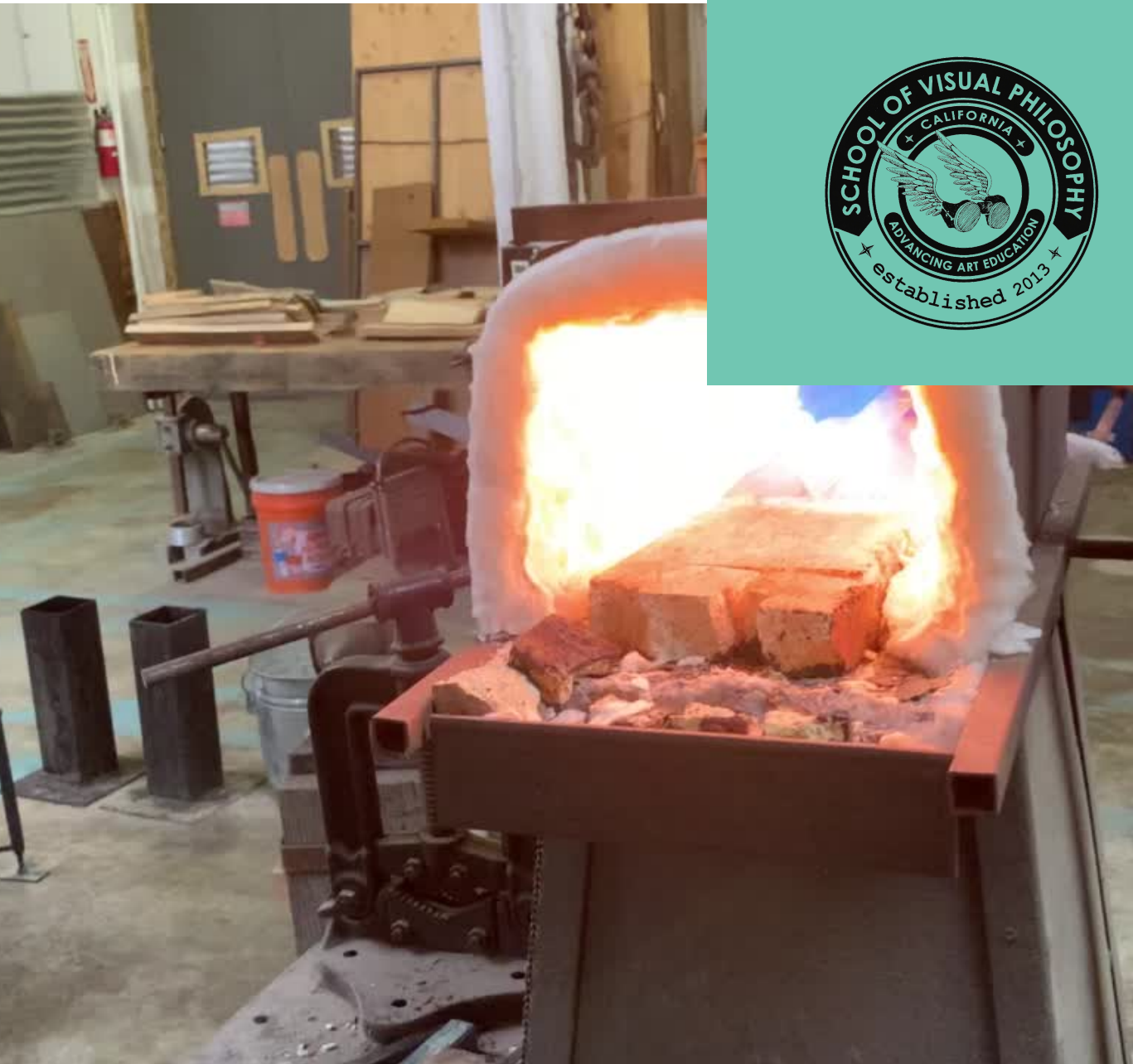


SCHOOL OF VISUAL PHILOSOPHY

PROPANE



INSTRUCTED
BY YORI SEEGER

PROPANE (& PROPANE ACCESSORIES)

I use propane for my fuel source in my forges and melting furnaces. It burns well and I have achieved temperatures that exceed my pyrometer, which only goes to 4,000 degrees Fahrenheit, which of course exceeds practical needs. At that temperature I began to melt my forge and turned it off never to repeat that again. It was a test to see the burner and fuel limitations. I do confess that in my youth I practiced controlled pyromania. But, back to the topic at hand. Propane is Liquid Petroleum Gas or LPG. It is generally compressed and stored in a liquid state. It is colorless and odorless. An agent is added to propane so that we can smell it which helps to detect leaks in equipment and LP lines.

It would be irresponsible not to note that although propane is a by-product of the production of natural gas, it is also directly made from crude oil and in recent years has begun to rely on fracking in the northeastern parts of the United States. I personally have issue with fracking, which is why I mention it here. We should all be aware of where our fuels are sourced and how to keep an appropriate balance in our world. Although I choose to use propane for my forges it is also possible to use natural gas with my burner designs. The issue with natural gas is that most home applications do not provide enough pressure in the provided gas lines. I have found it easier to use propane for this reason. In commercial situations I have used natural gas with great success but for the home application I recommend using propane.

I use a 20 gallon propane tank because smaller tanks tend to freeze up too quickly and become inhibitive. A 20 gallon tank does not freeze when running a single forge, but with three forges running it will freeze after a few hours if the tank is not submerged in a bucket of water or wrapped in a heated blanket.



Propane sits at the bottom of the tank in liquid form and vapors rise to the top. When the vapors are drawn from the tank and new vapors replace the space at the top of the tank the propane draws heat from the the walls of the tank. This process is similar to how air conditioners work. The cooling walls on the outside of the tank freeze the surrounding moisture resulting in ice that forms on the outside of your propane tank. The reason this is important to you the blacksmith is that when the propane freezes, vapors are no longer able to rise to the top and into your burner. Even if the tank is still full of usable propane you cannot use it and must wait until it thaws before you can continue to forge. A larger tank slows this process, giving you more working time.

The picture on the left shows my 20 gallon tank in a water bath. The next important piece of equipment is a regulator. Natural gas does not have enough force in residential homes and propane has too much pressure right out of the tank. Propane tanks must be pressurized at a range from 100-200 PSI or Pounds per Square Inch so that the propane inside the tank remains in a liquid state. There are variables to the pressure inside the tank such as volume of propane and ambient temperature. A 20 gallon tank at 70 degrees should have around 145 PSI. You cannot feed your forge burner with this much pressure. This is why we use a regulator to control the flow of propane coming from the tank. I use an adjustable regulator that has a range of 0-35 PSI. Many of my students think that more fuel equates to more heat. This is not necessarily the case. Each chamber that the burner heats has a unique signature due to size and shape. The ratio of fuel to forced air is the ticket to quality heat.