

~ FABRICATION ~



CERAMICS

OPERATING INSTRUCTIONS



CERAMICS

INTRODUCING

the



RAKU KILN



Raku kiln, LPG bottle and burner

Access Level 2 (see Ceramics Workshop Induction Guide on Access Levels)

Using Sawdust to mark and texture a heated pot or other ceramic work

PPE Basic

- Welding-rated leather gauntlets (provided)
- Leather Apron (provided)
- Eye-protection, rated to BS/EN166 (provided)
- Stout Leather Footwear
- Raku metal tongs

What to do before use

- A QUALIFIED member of technical staff MUST be present AT ALL times to CHECK the operation of the equipment and processes involved in the Raku firing
- Transport the Top-Hat Raku kiln, insulation bricks and other materials required for the Raku firing on a flatbed trolley to the firing site
- VISUALLY check the condition of the refractory blanket inside the steel Top-hat Raku kiln. Report if damaged.
- CAREFULLY lay a large refractory kiln shelf on a FLAT STABLE SURFACE within the chosen firing area
- CAREFULLY lay a bed of HT insulation bricks on-top of the kiln shelf, packing them TIGHTLY together
- Place three 9 inch kiln props on-top of the insulation bricks in a triangular pattern.
- A kiln shelf is placed on-top of the props to hold the pots
- The Raku kiln, when sitting on the insulation bricks, should fit OVER the kiln shelf leaving a gap of approx. 2 inches - or 5cm - from the kiln wall to the kiln shelf to allow heat to circulate in the kiln.

- A small kiln shelf should be placed **PARTIALLY** over the outlet at the top of the kiln so that adjustments can be made if too much heat is being lost by the kiln.
- Choose a **DRY DAY** to do the firing, if possible
- Raku can **ONLY** be performed **OUTDOORS**
- The site should be **CLEAR** of obstacles and flammable materials with **PLENTY OF SPACE** for personnel to move around the firing site
- **MAKE SURE** the valve hand-wheel at the top of the LPG bottle is **TURNED OFF** by turning it **CLOCKWISE**
- **MAKE SURE** the bottle contains enough gas for the firings to proceed. The **WEIGHT** of the bottle will give an indication of how much gas is in the bottle
- **SECURELY CHAIN** the gas bottle to an appropriate gas bottle trolley and transport it **UPRIGHT** to the firing area. The LPG bottle **MUST** remain chained to the trolley throughout the firing
- **VISUALLY** check the burner, gas regulator, gas hose and connections for signs of **DAMAGE**. Report **ANY** and **ALL** faults to the technical staff and E-mail the technical team to report if the regulator, gas hose or burner requires maintenance or servicing
- **DOUBLE-CHECK** that the LPG bottle is turned **OFF** by turning the valve hand-wheel at the top of the bottle clockwise
- **REMOVE** the protective plastic plug from the regulator seating and leave it hanging (to be replaced back on later)
- **VISUALLY** check that the bullnose connection on the regulator is **CLEAN** and **UNDAMAGED BEFORE** connecting. **REPORT** immediately if damage is found
- **CAREFULLY** introduce the regulator bullnose onto the regulator seating (left hand thread) and **HAND-TIGHTEN** the connecting nut using your fingers
- **FULLY** tighten the connecting nut using the correct spanner - this should normally be kept with the regulator
- To obtain gas **CAREFULLY TURN** the valve hand-wheel in an anti clockwise direction
- **CAREFULLY** position the gas burner **CLOSE** to the burner port of the kiln and position the LPG bottle **AS FAR** from the kiln as the gas hose will **SAFELY** run (avoid making the gas hose a trip hazard)
- **SAFETY BARRIERS MUST** be erected along the length of the gas hose from the LPG bottle to the burner to prevent a trip hazard
- Position the gas burner on a **SUITABLE** adjustable metal stand 1-2 inches (5cms) from the burner port.
- Steel bins only **SHOULD** be used to contain burning sawdust & hot water
- Long-handled steel tongs **SHOULD** be available - and kept **NEAR** to hand - to extract hot pots, at 1000C from the kiln

How to Use This LPG Gas System

- **A QUALIFIED member of technical staff MUST be present AT ALL times to CHECK the operation of the equipment and processes involved in the Raku firing**
- **ALL operators TIE BACK long hair, DO NOT wear loose flammable cloths and WEAR stout footwear**
- **CAREFULLY load the glazed Raku pots onto the COOL kiln shelf, making SURE that they are NOT touching each other.**
- **CAREFULLY place the Top-Hat Raku kiln top OVER the glazed work on the kiln shelf making sure it doesn't touch the glazed work or the kiln shelf (leave a gap of approx.2 inches or 5cm from the kiln wall to the kiln shelf to allow heat to circulate)**
- **MAKE SURE that the gas burner is in the CORRECT position so that the flame will enter the burner port of the kiln**
- **CAREFULLY turn the VALVE CONTROL WHEEL on the LPG bottle ANTI-CLOCKWISE to obtain gas**
- **CAREFULLY turn the REGULATOR CONTROL CLOCKWISE to obtain gas (this regulates the amount of gas available to the gas burner)**
- **CAREFULLY turn the burner torch valve to ON**
- **Depress the FLAME FAILURE button to obtain gas and ignite the gas with a spark or flame. DO NOT USE a cigarette lighter or other GAS-FILLED devices. They must get TOO CLOSE to the burner for these igniters to be used SAFELY**
- **CONTINUE to depress the flame failure button for AT LEAST 30 seconds or until the flame failure probe, at the mouth of the burner GLOWS RED**
- **RELEASE the flame failure button and the flame should continue to burn**
- **CAREFULLY adjust the flame by turning the REGULATOR CONTROL ANTI-CLOCKWISE to REDUCE the gas or CLOCKWISE to INCREASE the gas flow rate**
- **START the flame LOW and increase it as the firing progresses**
- **WEARING STOUT LEATHER WELDING GAUNTLETS, place the next batch of pots to be fired on-top of the kiln or around it to warm them up. This prevents thermal shock when the pots are loaded into the next firing**
- **INCREASE the gas GRADUALLY as the firing progresses**
- **WARNING: WEAR ONLY APPROVED SAFETY GOGGLES OR FACESHIELDS (RATED TO BS/EN166) WHEN VIEWING THE FIRING THROUGH THE VIEW PORT**
- **When a satisfactory melt is observed through the top vent of the Raku kiln, the Raku process can begin and the time started**
- **Once the time has elapsed at the required temperature, begin the removal process, as BELOW**
- **TURN the REGULATOR CONTROL ANTI-CLOCKWISE until the flame decreases and just idles**

- **TWO operators are required to lift the hot kiln from its base, using the handles attached to its jacket and place it on a non-flammable surface**
- **DO NOT ATTEMPT TO REACH INTO THE KILN TO INSPECT WORK UNDER ANY CIRCUMSTANCES**
- **The hot glazed pots can ONLY be removed from the hot kiln shelf using steel tongs**
- **The pots are CAREFULLY placed in a steel bin containing water-dampened saw-dust which smokes and may begin BURNING**
- **If the saw-dust does catch FIRE, add more water to the saw-dust and cover the bin with the lid**
- **OTHERWISE, more saw-dust can be placed on-top of the pots smothering them completely**
- **The PRE-WARMED pots, for the next firing, are CAREFULLY loaded onto the hot kiln shelf using stout welder's gauntlets**
- **TWO operators pick up the Raku kiln lid and place it CAREFULLY over the pots onto the base**
- **The flame is again adjusted by turning the REGULATOR CONTROL CLOCKWISE to start the next firing**
- **After approx. 15-20 minutes the hot pots in the saw-dust can be removed from the Steel bin**
- **The pots are placed into a second Steel bin, containing water ONLY, to rapidly cool the pots**
- **When the pots have cooled down they are CAREFULLY removed from the water, using the METAL TONGS, as they still contain quite a lot of RESIDUAL HEAT**
- **When ALL the pots have been fired and the Raku session is FINISHED, the Raku kiln, burner and support materials MUST be left to cool before being transported**
- **ENSURE the regulator is turned OFF - by turning the REGULATOR CONTROL ANTI-CLOCKWISE**
- **ENSURE the LPG bottle is turned OFF - by turning the bottle CONTROL VALVE CLOCKWISE**
- **ENSURE the burner is COOL before transporting the LPG bottle back to its storage area**
- **ENSURE that the sawdust is THOROUGHLY DOUSED with water to stop it re-igniting and causing a fire**

Date

I verify that I have read and understood the information detailed within this document

Name

Signature