

NORTHCOTE POTTERY SUPPLIES

TECHNICAL TIPS AND PRODUCT INFORMATION #18

ELECTRIC KILN OPERATION

KNOW YOUR KILN

- Ensure you know the brand, model number and maximum temperature of your kiln – this is usually written on the metal name plate attached to the kiln.
- Locate all manuals associated with the kiln, the kiln controller and the vent system before attempting to use the kiln. Check if there is any additional information such as firing schedules, kiln log book or service manual etc. Contact the manufacturer for replacement instructions.
- Run through the electric kiln maintenance checks first, then find out when the kiln was last used and by whom? Was the kiln fully operational? If you are in any doubt, call a kiln electrician to check the kiln before embarking on a firing.
- Never fire a kiln overnight or rely on a controller you have never used – ALWAYS MANUALLY CHECK THAT THE KILN HAS TURNED OFF, OR TURN IT OFF YOURSELF.

COMMENCING FIRING

- NEVER RUN AN INITIAL FIRING OVERNIGHT OR WITHOUT ONGOING SUPERVISION.
- Once you are sure the kiln is operational, make sure you have a kiln shelf on the bottom of the kiln (on the soft brick floor). All the props and other shelves will press their weight onto the shelf so make sure it's flat and stable in this position. Use only 3 props per layer when stacking - never 4. Four props per shelf encourages cracking. Make sure each prop is placed directly above the prop on the level below, and that this continues through all the levels of shelves.
- Pay particular attention to how pottery items are placed in the kiln – always allow at least 3cm clearance above a packed shelf for the heat to circulate to the work in the center of the shelf.
- Do not set the first shelf in an electric kiln firing at any less than 4 - 6 inches from the floor – this allows the first element to direct heat into this area which is more difficult to heat than areas further up in the kiln.
- Ideally, a kiln should not be fired less than full. If you don't have enough work, pack the usual shelves into the kiln and distribute the work evenly throughout the kiln – do not mass everything in one area (especially the bottom of the kiln).
- NEVER touch pottery items to the kiln walls when packing.
- NEVER touch pottery to kiln elements or the thermocouple (ceramic sheathed thermometer visible inside kiln).
- Do not hang pottery items over the edge of the kiln shelves – this may cause cracking, warping, distortion etc.
- Make sure that the kiln door will close without touching pottery items. Also, be sure that no pottery touches the roof of the kiln – when firing starts the pottery items expand somewhat and may break if packed too tightly against the kiln body.
- If your kiln has a roof hood/flue extraction, put the kiln door bungs in, and leave the roof bungs out (always).
- If your kiln has a vent system direct from the kiln floor, be sure that all the bungs are in place in the roof & door for the venting to operate effectively.
- The initial firing rate (for bisque) should be somewhat slower than the glaze firing rate, especially from 0°C - 300°C when chemically combined water is being driven off, and up to 550°C – 600°C when quartz inversion takes place. Ideally, a firing can be taken slowly up to 600°C, then the heating rate can be increased from there. (Try between 40-80c/hour for conservative bisque firing.)
- Once the kiln door is closed, turn the kiln and vent/extractor on and listen for the sound of the kiln 'clunking' on – the power will phase in and out making a ssszzzzzzzzing sound, then clunk off, then return to the ssszzzzzzing sound and turn off repeatedly. (This is not the sound of something going wrong – it is the kiln being supplied with minimal amounts of power in order to heat slowly.)
- A general guide to heating rates would be 70°C – 100°C/HR for an average bisque firing, and 40°C – 80°C/HR for very thick work. This same rate could be necessary for both the bisque and glaze firing for large/very thick work.
- IT SHOULD NOT BE necessary to soak a firing for more than 10 minutes at top temperature in a glaze firing. Soaking for too long is equivalent to firing to a higher temperature and with glaze this could mean firing runny glaze effects.
- Most firings should not exceed 120°C/hr unless they are for decals, lustre or slipcast ware.
- THE FIRING SCHEDULE FOR EACH FIRING SHOULD BE DESIGNED TO ACCOMMODATE THE WORST PIECE OF WORK IN THE KILN (not the best, or the average of all the pieces).

COOLING A FIRING

- A firing will take almost as long to cool as it takes to reach temperature.
- Do not open a kiln until it is at least 200°C or less, and even then, just crack the door & leave for a few hours to get to 60-80°C.
- Before unpacking the kiln, try to assess the success of the firing – does all the work look OK? Does some work look underfired/overfired? This is best done while the work is still in place in the kiln because sometimes poor performance can be related to under firing due to elements burning out in a particular zone, too tight packing of the ware on one shelf, etc.
- While unpacking, check for excessive glaze application (glaze running and sticking pots to shelves) and other faults which suggest modifying your making/decorating processes.
- Ensure the kiln is in good condition (see Tip Sheet #17 Electric Kiln Maintenance) before the next firing.
- Take care not to knock or break the thermocouple when emptying the kiln of shelves.
- Log the firing and kiln behavior in the kiln logbook. Consider the suitability of your firing schedule in light of the results gained from the firing. Was it a good firing or not? Could you improve the next firing by modifying the program?
- Ensure that all the kiln furniture is in good shape for the next firing.
- Close the kiln door when not in use.