Kilns

Activity scope

This document relates to the loading, unloading, operating or firing of Kilns (dependant on kiln type and safety considerations) as a curriculum activity. This may involve kilns which are high temperature furnaces used to fire clay and ceramic items. Kilns are usually insulated with ceramic fibre material (CFM) or firebricks. They require programming, loading, unloading, cleaning, monitoring and servicing.

Special considerations

Students must not be involved in any activities related to kilns. Any learning they undertake in relation to kilns will be from watching qualified adults operate the equipment.

Copper chrome arsenate treated timber and other chemically treated wood or sawdust must not be used or burnt in kilns.

Kerosene and oil drip kilns must not be used in school.

Minimum activity-specific qualifications for supervisors

Medium risk level (loading and unloading all kilns)

- An adult with Competence (demonstrated ability/experience) in kiln usage.

High risk level (programming, setting and firing kilns)

- For a registered teacher, Competence (demonstrated ability/experience) in kiln usage
- For a leader other than a registered teacher – expertise (formal qualifications) in kiln usage with the following: CUV30103: Certificate II in Visual Arts and Contemporary Craft (TAFE or equivalent), specialising in ceramics.

Minimum activity-specific equipment/facilities

- Kiln located in a kiln house or a kiln room.
- Kiln with the following features:
  - adequate insulation on all parts
  - a programmable controller
  - an automatic cut-off control device
  - a door/lid-locking arrangement
  - a door/lid-locking power cut-off switch
  - an enclosed and lockable control panel
  - a red pilot light viewable from the exterior to indicate kiln operation/firing process is continuing
  - a safety heat fuse.
- An extraction system that operates effectively at all times during the firing cycle, and vents outside the building, away from populated areas such as walkways and areas where staff and students may congregate.
- All who load, fire, unload or clean kilns must wear appropriate personal protective equipment (e.g. facemask or breathing apparatus, gloves) that conforms to Australian standards to prevent:
  - respiration of toxic fumes, ceramic fibres, and clay and glaze dust
  - ceramic fibres contacting the skin and eyes
  - burns from handling hot materials and equipment.
- Injury management procedure in place.
- Ensure that, for maintenance purposes, a log book is kept for each kiln for staff to record the following.
- dates of firing
- types of firing
- start and end times for firing
- changes in the condition of the kiln lining, structure and extraction system.

- P2 half-face respirators should be used as they prevent respiration of both dust particles and fumes, and are available in re-usable and disposable forms.

- When choosing suitable gloves, ensure they are specified to protect against the temperatures associated with the activity.

- Gloves must:
  - fit the user and be worn in accordance with manufacturer’s instructions
  - be maintained and stored in accordance with manufacturer’s instructions.

- Ensure that non-asbestos, fire-resistant gloves (kaowool gloves) are used when handling hot materials and objects such as spy-hole bungs, raku tongs, hot pots and kiln shelves during unloading.

Activity-specific hazards/risk and suggested control measures

- Ensure that kilns are only fired when staff and students are not exposed to emissions. For example:
  - outside of school hours
  - on occasions when classrooms and workshops are not in use, such as on sports days or during excursions
  - when wind direction will sweep kiln emissions away from occupied buildings.

- Implement a protocol for cooling down the kiln.

- Ensure that all who unload the kiln observe the following procedure:
  - the kiln extraction system is running (i.e. leave the extraction system on to enable extraction of fumes to continue/check automatic exhausts)
  - open the kiln door and immediately vacate the room to allow any remaining fumes to disperse
  - unload the kiln after remaining fumes have dispersed.

- Temporary wood-fired or sawdust kilns should be constructed well away from buildings, long grass and dense bushland. Teachers should consider local council requirements regarding fire and smoke regulations.

- Mark floors with a safety line so there is a clear demarcation of safe and unsafe areas.

- Position kiln to ensure there is air movement all around the kiln and good access for servicing.

- Ensure kilns that do not have a programmable controller are only fired under strict supervision.

- All ceramic materials are supplied with a Material Safety Data Sheet (MSDS). Information relating to known or suspected health risks should be provided in the MSDS, along with safe working practices to be implemented.

- The condition of the lining of kilns should be monitored regularly by staff. Changes to the lining will occur as a result of temperature and wear and tear caused by use of the kiln. Deterioration of the lining can lead to the release of air-borne fibres which are respirable and may lodge in the lungs of exposed people.

- If the lining becomes powdery and crumbling, it should be reported and fixed immediately.

- Staff should avoid brushing or scraping the ceramic fibre surfaces with clothing, or with items to be fired.

- Ensure that the supplier, manufacturer or service agent is employed to regularly service the kiln in accordance with manufacturer’s specifications.

- When cleaning kilns, the following should be observed:
  - for cleaning the exterior of the kiln and the kiln enclosure, cleaners should refer to the document ‘Art Kilns – The Cleaner’s Responsibility’, located with the cleaner’s induction manual
  - ensure kilns with severe surface damage to the lining are withdrawn from use until repaired
- Clay dust is generated by all activities using clay. Good housekeeping methods should be maintained to minimise the distribution of dust and fibres.
  - Dry sweeping is not permitted in or around the kiln, or in any areas where clay or ceramic materials are used.
  - The preferred method for cleaning clay and ceramic materials is wet mopping/wiping. Cleaning materials must be rinsed well with water.
  - An alternative cleaning method is to vacuum using equipment fitted with a high efficiency particulate air (HEPA) filter and appropriate bag.
  - Ensure the manufacturer’s instructions are followed for cleaning the interior of the kiln.

- A firing schedule should be implemented for kilns, including for bisque and gloss firings.
- Hazardous substance guidelines must be adhered to.
- Food and drink must not be taken into or consumed in classroom, studio or workshop areas.
- To ensure fibres are not transferred to other areas, hands should be washed:
  - Before leaving the classroom, studio or workshop areas.
  - Before handling food or drink.
  - Before using toilet facilities.
  - After using thermal insulating gloves.

- P2 respirators must be:
  - Fitted in accordance with manufacturer’s instructions (individuals whose facial characteristics prevent close fitment of respirators should contact the manufacturer for advice on alternative products).
  - Fitted and removed with clean, bare hands (not wearing gloves).
  - Stored in accordance with manufacturer’s instructions (in a sealed plastic bag or container).

- All gloves should be handled carefully after use to avoid release of respirable fibres and dust that may have stuck to the gloves during use. For example:
  - Remove gloves carefully.
  - Do not shake gloves.
  - Store gloves in a sealed plastic bag immediately after use.

- Only the teacher or leader should remove spy-hole bungs and kiln seals.
- Guidelines/codes of practice are established for this activity. See Queensland Art Teachers’ Association. Obligations have been established for health and safety requirements for hazardous materials. See Workplace Health and Safety Queensland.

Useful activity-specific links
- Queensland Art Teachers’ Association http://www.qata.qld.edu.au/