Australian Government

Department of Education, Employment and Workplace Relations

CUVACD510A Manage kiln operations

Release: 1

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Modification History

Version	Comments
CUVACD510A	This version first released with *CUV11 Visual Arts, Craft and Design Training Package version 1.0*

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to safely manage the technical operation of a kiln in the context of independent art craft or design practice.

Application of the Unit

Artists and craftspeople such as ceramicists, glass artists and sculptors apply the skills and knowledge in this unit. They must be able to safely manage the operation of a kiln as part of an independent creative practice. They may also be responsible for the purchase or construction of their own kilns.
At this level, work is carried out independently with some mentoring and guidance available as required.

Licensing/Regulatory Information

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Element	Performance Criteria
Elements describe the essential outcomes of a unit of competency.	*Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.*

Elements and Performance Criteria

1. Prepare for kiln work	1.1 Assess the ways in which different ***kilns*** may be used for craft work and apply to own practice 1.2 Inform approach to kiln work through research of ***historical and contemporary trends*** 1.3 Source and access appropriate kiln for own work 1.4 Evaluate the value and potential of own kiln purchase against the potential benefits of constructing own kiln 1.5 Where appropriate, experiment with the building of own kiln 1.6 Investigate the specific ***safety issues*** associated with kiln work and integrate procedures into own work practices
2. Set up kiln work space	2.1 Review ***key requirements*** for kiln set-up 2.2 Confirm or create appropriate conditions before starting the firing process 2.3 Identify emerging or potential safety issues and take action to address them
3. Assess firing options	3.1 Determine firing options for the work being made 3.2 Determine relevant energy source or fuel 3.3 Determine relevant ***firing program requirements*** and optimum firing time 3.4 If relevant, determine the necessary conditions to produce the required kiln atmosphere for the specific process
4. Operate and monitor the kiln	4.1 Evaluate and carry out specific ***kiln loading and unloading requirements*** according to safety requirements 4.2 Set required kiln controls or light kiln according to kiln type being used 4.3 Fire the kiln according to required firing schedule 4.4 Monitor kiln operation and ***firing process*** 4.5 Identify and resolve ***technical problems*** in the firing process 4.6 Carry out appropriate shut-down procedures 4.7 Liaise with others on technical and creative aspects of firing, including collaboration on specific challenges
5. Address documentation requirements	5.1 Set up a firing log that includes required ***information*** 5.2 Record firing details in the log for all work completed 5.3 Review firing logs to inform future work

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- communication skills to liaise with others about kiln operations and technical challenges
- critical thinking and analytical skills to:
  - evaluate the needs of particular work projects to establish kiln and firing requirements
  - research and evaluate historical and contemporary trends in kiln work
- literacy skills to read kiln specifications and requirements
- problem-solving skills to identify and resolve:
  - technical and design issues in kiln work
  - technical firing issues
- numeracy skills to:
  - estimate costs for kilns and kiln operation
  - work with numerical features of kilns and firing processes, including temperatures and controls
- self-management, planning and organising skills to:
  - evaluate needs of own practice in relation to kilns
  - set up a kiln and kiln work space
  - set up and monitor the firing process
- technology skills to safely use technical features of kilns.

Required knowledge

- historical, contemporary and emerging trends in kiln types, kiln construction and kiln operation
- properties and capabilities of the range of firing materials, tools and equipment, including pyrometric instruments
- properties and specification of different kiln types
- specific firing processes, including required firing stages, changes to materials, temperature range and timing of each stage of the process
- typical problems that occur with kilns and with the firing process and how they may be resolved in the context of relevant materials and art forms
- sustainability considerations for kiln work
- OHS requirements for the set-up, operation and maintenance of kilns.

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • apply safe work practices when using kilns • produce multiple fired craft pieces that are technically sound and free from faults arising from the firing process • prepare own firing schedules • pack and fire kilns independently • apply knowledge of kiln types and kiln operations.
Context of and specific resources for assessment	Assessment must ensure access to: • a workplace or studio for the firing of craft work.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • evaluation of work produced by the candidate in terms of its technical resolution • direct observation of work in progress, including exploration of, and experimentation with, techniques • written and/or oral questioning and discussion to assess knowledge and candidate's intentions and work outcome • review of portfolios of evidence • review of third-party reports from experienced practitioners. Assessment methods should closely reflect work place demands (e.g. literacy) and the needs of particular groups (e.g. people with disabilities, and people who may have literacy or numeracy difficulties, such as speakers of languages other than English, remote communities and those with interrupted schooling).
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • CUVCER502A Investigate ceramic materials and processes • CUVGLA502A Investigate glassworking materials and processes.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Kilns may be:	• electric • gas • pit • raku • salt • wood.

Historical and contemporary trends may relate to:	• annealing ovens
	• enamelling kilns
	• glass-casting kilns
	• history and development of kilns:
	  • early Chinese, Japanese and Korean
	  • early European
	  • modern kilns
	primitive and tribal, including New Guinean, African, Micronesian and pre-Columbian
	• high fire pottery kilns
	• sculpture kilns
	• stained glass and flat glass kilns
	• source of energy, including fuel types, structure and configuration of different types of kilns.

Safety issues may relate to:	• correct lifting techniques
	• kiln emissions
	• safe use of equipment
	• specific hazards associated with:
	  • extreme heat
	  • fuels
	• use of personal protective equipment (PPE) to protect against dust and fibres.

Key requirements relate to:	• cleaning • kiln location • monitoring equipment • safety equipment, including PPE • space around kiln • storage of kiln furniture and equipment

	• ventilation • work to be fired.
Firing program requirements may include:	• annealing requirements • firing profile • maximum temperature • optimum firing time • soak times.

Kiln loading and unloading requirements may relate to:	• positioning of work to take account of:
	  • adequate pathways for flames
	  • even distribution of temperature
	• ventilation of fumes and vapours
	• props
	• shelving
	• stability.

Firing process may include:	• firing stages, the changes at each stage, and the temperature range and time as they relate to ceramics:
	  • biscuit firing
	  • glost firing
	  • creating reduction in the clay body and the glaze
	  • causing oxidation in the clay body and the glaze
	  • maintaining a neutral atmosphere
	  • creating a primitive fired effect
	  • creating blackware
	  • raku firing
	  • saltglaze firing
	  • wood firing
	  • using saggars for support or effect
	• firing stages, the changes at each stage, and the temperature range and time as they relate to glass:
	  • firing enamels and lustres
	  • stained glass firing
	  • bending
	  • slumping
	  • fusing
	  • kiln casting
	  • thick work
	  • complex work
	  • annealing.

Technical problems may relate to:	• bloating • colour issues

	• dunting • firing cracks • thermal shock • overfiring • underfiring • warping.
Information may include:	• control mechanisms used • firing process • energy and fuel type • timing.

Unit Sector(s)

Visual communication – art, craft and design