



Australian Government

Department of Education, Employment and Workplace Relations

CPCCSV5009A Assess the impact of fire on building materials

Release: 1

CPCCSV5009A Assess the impact of fire on building materials

Modification History

Not Applicable

Unit Descriptor

Unit descriptor This unit of competency specifies the outcomes required to assess the impact of fire on building materials.

It includes the research, analysis and reporting of testing conducted on a range of building materials and structures in differing circumstances to determine combustion, flammability, heat transfer, burning conditions, building material behaviour, fire loads of buildings and fire resistance.

Application of the Unit

Application of the unit This unit of competency supports the attainment of the understanding and skills to assess the impact of fire on building materials within the context of relevant legislation, the Building Code of Australia (BCA) and Australian standards.

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units Nil

Employability Skills Information

Employability skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

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

ELEMENT	PERFORMANCE CRITERIA
1. Research combustion process as it relates to different materials.	1.1. Processes and flame characteristics of combustion of solids, liquids and gases are identified and recorded from a research and analysis process. 1.2. Factors contributing to combustion are identified and recorded. 1.3. Endothermic and exothermic processes are researched and recorded. 1.4. Heat of combustion fuels is calculated without error. 1.5. Factors contributing to propagating flame front are analysed and recorded.
2. Analyse flammability of matter in different states.	2.1. Flammability in terms of fire triangle and fire tetrahedron theories is analysed and recorded. 2.2. Flammability of matter in physical states is examined and recorded. 2.3. Flammability in terms of upper and lower flammability limits is identified and recorded. 2.4. Factors contributing to the explosiveness of dusts are identified and recorded.
3. Identify conditions of burning at the fire point.	3.1. Limiting adiabatic flame temperature (LAFT) values are interpreted accurately. 3.2. Process of extinguishment related to the combustion process is analysed and recorded.
4. Record mechanisms of heat transfer during fire growth, development and spread.	4.1. Heat transfer factors in fire situations are identified and recorded. 4.2. Processes of self-induced heating are analysed and recorded. 4.3. Behaviour of fires in partially and fully enclosed compartments are observed and recorded. 4.4. Amount of smoke produced from a fire is calculated.
5. Record the behaviour of building materials subjected to extreme levels of heat.	5.1. Building materials are evaluated for fire safety and fire resistance levels are recorded. 5.2. Effect of fire on structural and non-structural elements is identified and recorded. 5.3. Effect of fire on plastic and textile materials is identified and recorded.
6. Devise the fire load of a building and	6.1. Effect of building occupancy on potential fire load is calculated.

ELEMENT	PERFORMANCE CRITERIA
describe the effect on the BCA classification and compartmentation.	6.2. Factors that may increase the severity of a fire are researched and recorded. 6.3. Fire load, fire severity and general burning behaviour of materials are researched and recorded.
7. Report the requirements of fire resistance of building elements and forms of construction.	7.1. Fire resistance levels of building elements and forms of construction are researched and recorded. 7.2. Early fire hazard indices are applied to the BCA requirements. 7.3. Australian standards relating to fire testing of building materials and forms of construction are researched and recorded.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills for this unit are:

- ability to respond to change and contribute to workplace responsibilities, such as current work site environmental and sustainability frameworks or management systems
- communication skills to:
 - enable clear and direct communication, using questioning to identify and confirm requirements, share information, listen and understand
 - evaluate own actions to make judgements about performance
 - read and interpret Australian standards
 - use language and concepts appropriate to cultural differences
 - use and interpret non-verbal communication
 - written skills to report testing of building materials
- numeracy skills to apply calculations and interpret data
- problem solving skills to carry out tests and calculations and to use and apply data for decision making
- technological skills to:
 - complete documentation and calculations
 - enable information gathering and analysis.

Required knowledge

REQUIRED SKILLS AND KNOWLEDGE

Required knowledge for this unit is:

- characteristics of endothermic and exothermic processes
- extinguishment principles
- LAFT values
- principles of combustion and flammability
- processes for the preparation of documentation
- relevant federal, state or territory legislation and local government policy and procedures
- research methods.

Evidence Guide

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

This unit of competency could be assessed in the workplace or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques fully replicate construction workplace conditions, materials, activities, responsibilities and procedures.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

A person who demonstrates competency in this unit must be able to provide evidence of the ability to:

- comply with OHS regulations applicable to workplace operations
- apply organisational management policies and procedures, including quality assurance requirements where applicable
- perform fire research, analysis, identification and reporting of findings for at least one fire assessment or equivalent, including at least three different materials
- assess applicable fire safe suitable building materials for at least one building project
- provide reports to appropriate body/individual as determined by the project brief.

Context of and specific resources for assessment

This competency is to be assessed using standard and authorised work practices, safety requirements and environmental constraints.

Assessment of essential underpinning knowledge will usually be conducted in an off-site context.

Assessment is to comply with relevant regulatory or Australian standards' requirements.

Resource implications for assessment include:

- an induction procedure and requirement
- realistic tasks or simulated tasks covering the mandatory task requirements
- relevant specifications and work instructions
- tools and equipment appropriate to applying

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safe work practices

- support materials appropriate to activity
- workplace instructions relating to safe work practices and addressing hazards and emergencies
- material safety data sheets
- research resources, including industry related systems information.

Reasonable adjustments for people with disabilities must be made to assessment processes where required. This could include access to modified equipment and other physical resources, and the provision of appropriate assessment support.

Method of assessment

Assessment methods must:

- satisfy the endorsed Assessment Guidelines of the Construction, Plumbing and Services Training Package
- include direct observation of tasks in real or simulated work conditions, with questioning to confirm the ability to consistently identify and correctly interpret the essential underpinning knowledge required for practical application
- reinforce the integration of employability skills with workplace tasks and job roles
- confirm that competency is verified and able to be transferred to other circumstances and environments.

Validity and sufficiency of evidence requires that:

- competency will need to be demonstrated over a period of time reflecting the scope of the role and the practical requirements of the workplace
- where the assessment is part of a structured learning experience the evidence collected must relate to a number of performances assessed at different points in time and separated by further learning and practice, with a decision on competency only taken at the point when the assessor has complete confidence in the person's demonstrated ability and applied knowledge

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- all assessment that is part of a structured learning experience must include a combination of direct, indirect and supplementary evidence.

Assessment processes and techniques should as far as is practical take into account the language, literacy and numeracy capacity of the candidate in relation to the competency being assessed.

Supplementary evidence of competency may be obtained from relevant authenticated documentation from third parties, such as existing supervisors, team leaders or specialist training staff.

Range Statement

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.

Research and analysis process includes:

- definitions and test outcomes
- material safety data sheets (MSDS)
- reports
- written records and historical data.

Materials:

- include timber, plastic and fabric building materials and structures
- may include other types of fire load forming building materials.

Effect of fire on structural and non-structural elements includes:

- behaviour of building materials subject to extreme heat
- combustion of materials
- fire loads of buildings
- fire resistance of materials
- flammability circumstances
- heat transfer characteristics
- point of fire burning conditions.

Unit Sector(s)

Unit sector Construction

Co-requisite units

Co-requisite units Nil

Functional area

Functional area