



Australian Government

Department of Education, Employment and Workplace Relations

FPICOT3235B Machine material using CNC machining and processing centres

Release: 1

FPICOT3235B Machine material using CNC machining and processing centres

Modification History

Not Applicable

Unit Descriptor

Unit descriptor

This unit describes the outcomes required to set up, operate and maintain computer numerically controlled (CNC) machining and processing centres used for the production of panels and components. The unit includes operator maintenance

General workplace legislative and regulatory requirements apply to this unit; however there are no specific licensing or certification requirements at the time of publication

This unit replaces FPICOT3235A Machine material using CNC sizing machines

Application of the Unit

Application of the unit

The unit involves machining material using CNC sizing machines in a forest products factory setting

The skills and knowledge required for competent workplace performance are to be used within the scope of the person's job and authority

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Not Applicable

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. Prepare for machining	<p>1.1. Applicable <i>occupational health and safety</i> (OHS), <i>environmental</i>, <i>legislative</i> and <i>organisational requirements</i> relevant to machining material using CNC sizing machines are identified and followed</p> <p>1.2. <i>Work order</i> is reviewed and clarified with <i>appropriate personnel</i></p> <p>1.3. Type and quantity of <i>material</i> to be <i>machined</i> is acquired from the <i>storage location</i></p> <p>1.4. <i>Equipment</i> is selected appropriate to work requirements and checked for operational effectiveness in line with manufacturer recommendations</p> <p>1.5. Material <i>machining process</i> is planned in line with site procedures and environmental requirements</p> <p>1.6. <i>Communication</i> with others is established and maintained in line with OHS requirements</p>
2. Set up machine	<p>2.1. <i>CNC program</i> is set to job specifications</p> <p>2.2. Safety equipment, including emergency stops, gauges, guards and controls, is checked</p> <p>2.3. <i>Machine settings</i> and adjustments are made in line with job requirements and machine and tool manufacturer's instructions</p> <p>2.4. Machines, <i>cutting tools</i> and <i>jigs</i> are checked for safe and effective operation</p> <p>2.5. Trial runs are conducted to check machine operation, accuracy and quality of finished work</p> <p>2.6. Final adjustments are made to the CNC programs and equipment in line with workplace procedures</p> <p>2.7. Successful trial runs are included in the process and unsuccessful trial runs are <i>disposed of</i> in line with site procedures and environmental requirements</p>
3. Operate machine	<p>3.1. <i>Pre-startup checks</i> are carried out on equipment in line with site requirements</p> <p>3.2. Material is fed into machine in line with manufacturer's instructions, safe handling procedures and standard workplace operating procedures</p> <p>3.3. Machine is operated in line with its designed capacity and purpose, tooling requirements and manufacturer recommendations</p> <p>3.4. Machine operation is monitored to ensure product quality and <i>output</i></p> <p>3.5. <i>Waste</i> quantities are checked and minimised</p> <p>3.6. Items that do not meet quality requirements are repaired or disposed of in line with workplace</p>

ELEMENT**PERFORMANCE CRITERIA**

- procedures
- 3.7. Machining process and equipment faults are ***recorded and reported*** to the appropriate personnel
4. Conduct operator maintenance
- 4.1. Equipment lock-out procedures are followed in line with OHS legislation and site procedures
- 4.2. Cutting tools are checked for blunt or damaged condition in line with site procedures
- 4.3. Cutting tools are removed and replaced in line with manufacturer recommendations
- 4.4. Removed cutting tools are ***dealt with*** in line with site procedures, manufacturer recommendations and environmental requirements
- 4.5. Machining area is kept clear of dust, off-cuts and debris in line with OHS and environmental requirements

Required Skills and Knowledge**REQUIRED SKILLS AND KNOWLEDGE**

This describes the essential skills and knowledge and their level required for this unit.

Required skills

- Technical skills sufficient to use and maintain relevant tools, machinery and equipment; efficiently and safely machine material using CNC sizing machines
- Communication skills sufficient to use appropriate communication and interpersonal techniques with colleagues and others
- Literacy skills sufficient to record and report workplace information; maintain documentation
- Numeracy skills sufficient to measure, estimate and calculate time required to complete a task
- Problem solving skills sufficient to identify problems and equipment faults; demonstrate appropriate response procedures

Required knowledge

- Applicable commonwealth, state or territory legislation, regulations, standards, codes of practice and established safe practices relevant to the full range of processes for machining material using CNC sizing machines
- Environmental protection requirements, including the safe disposal of waste material (including preservative treated timber), the minimisation of carbon emissions, and the cleaning of plant, tools and equipment
- Organisational and site standards, requirements, policies and procedures for

REQUIRED SKILLS AND KNOWLEDGE

machining material using CNC sizing machines

- Environmental risks and hazards
- Criteria for recycling and re-using unsuccessful trial runs/items that do not meet quality requirements
- Using energy effectively and efficiently
- Using material effectively and efficiently
- Characteristics of timber, timber products and defects
- Setup and operation of CNC equipment
- Cutting patterns and sequences
- Methods for assessing condition of cutting tool
- Industry standard cross sections and lengths
- Established communication channels and protocols
- Problem identification and resolution strategies, and common fault finding techniques
- Types of tools and equipment, and procedures for their safe use and maintenance
- Appropriate mathematical procedures for estimating and measuring, including calculating time to complete tasks
- Procedures for recording and reporting workplace information

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

A person who demonstrates competency in this unit must be able to provide evidence that they can safely and efficiently machine materials using CNC sizing machines according to organisational requirements

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

The evidence required to demonstrate competency in this unit must be relevant to, and satisfy, all of the requirements of the elements of this unit and include demonstration of:

- following applicable commonwealth, state or territory legislative and regulatory requirements and codes of practice relevant to machining material using CNC sizing machines
- following organisational policies and procedures relevant to machining material using CNC sizing machines
- machining materials using CNC equipment in line with the work order and within prescribed organisational tolerances
- setting computer programs for the CNC equipment to follow
- conducting operator maintenance on CNC equipment

Context of and specific resources for assessment

- Competency is to be assessed in the workplace or realistically simulated workplace
- Assessment is to occur under standard and authorised work practices, safety requirements and environmental constraints
- Assessment of required knowledge, other than confirmatory questions, will usually be conducted in an off-site context
- Assessment is to follow relevant regulatory or Australian Standards requirements
- The following resources should be made available:
 - workplace location or simulated workplace
 - materials and equipment relevant to undertaking work applicable to this unit
 - specifications and work instructions

EVIDENCE GUIDE

Method of assessment

- Assessment must satisfy the endorsed Assessment Guidelines of the FPI11 Training Package
- Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of required knowledge
- Assessment must be by direct observation of tasks, with questioning on required knowledge and it must also reinforce the integration of employability skills
- Assessment methods must confirm the ability to access and correctly interpret and apply the required knowledge
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances
- Assessment may be in conjunction with assessment of other units of competency
- The assessment environment should not disadvantage the candidate
- Assessment practices should take into account any relevant language or cultural issues related to Aboriginality, gender or language backgrounds other than English
- Where the participant has a disability, reasonable adjustment may be applied during assessment
- Language and literacy demands of the assessment task should not be higher than those of the work role

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.

RANGE STATEMENT

OHS requirements:

are to be in line with applicable commonwealth, state or territory legislation and regulations, and organisational safety policies and procedures, and may include:

- personal protective equipment and clothing
- safety equipment
- first aid equipment
- fire fighting equipment
- hazard and risk control
- fatigue management
- elimination of hazardous materials and substances
- safe forest practices, including required actions relating to forest fire
- manual handling including shifting, lifting and carrying

Environmental requirements may include:

- legislation
- organisational policies and procedures
- workplace practices

Legislative requirements:

are to be in line with applicable commonwealth, state or territory legislation, regulations, certification requirements and codes of practice and may include:

- award and enterprise agreements
- industrial relations
- Australian Standards
- confidentiality and privacy
- OHS
- the environment
- equal opportunity
- anti-discrimination
- relevant industry codes of practice
- duty of care

Organisational requirements may include:

- legal
- organisational and site guidelines
- policies and procedures relating to own role and responsibility
- quality assurance
- procedural manuals
- quality and continuous improvement

RANGE STATEMENT

processes and standards

- OHS, emergency and evacuation procedures
- ethical standards
- recording and reporting requirements
- equipment use, maintenance and storage requirements
- environmental management requirements (waste minimisation and disposal, recycling and re-use guidelines)

RANGE STATEMENT

Work order is to include:

- instructions for the machining and despatch of timber and timber products from the work site

and may include:

- type
- size
- length
- angle
- quantity
- grade
- instructions for the environmental monitoring of work and procedures
- environmental care requirements relevant to the work

Appropriate personnel may include:

- supervisors
- suppliers
- clients
- colleagues
- managers

Material may include:

- native timber species
- imported timber species
- dressed timber
- in-the-rough timber
- stress and non-stress graded timber
- preservative treated timber
- medium density fibreboard
- laminated veneer
- chipboard
- fibreboard and other manufactured board products
- coated and/or treated timber products
- beams, including laminated beams

Machining is to include:

- boring
- routing
- mortising operations with CNC equipment

Storage locations may include:

- storage racks
- storage bays
- bins
- stacks
- pallet boxes
- modularised storage components

RANGE STATEMENT

- temporary stacking bays (stand, frame or ground)

and may be divided into:

- standard product classification
- product designation
- size
- dimension
- stack number
- weight
- grade
- shelf life
- stock rotation position

RANGE STATEMENT

Equipment is to include:

- CNC machining and processing centres, including three axis machining centres
- procedures for lock-out, such as protecting operators and co-workers from accidental injury by isolating the machine from the power source

and may include:

- multi-tasking machining centres
- flat-bed routers and mortisers
- dust extraction equipment

Machining process may include:

- selecting and adjusting templates suitable for marking
- checking profile cutters and finished product
- selecting and checking necessary adjustments to cutters

Communication may include:

- verbal and non-verbal language
- constructive feedback
- active listening
- questioning to clarify and confirm understanding
- use of positive, confident and cooperative language
- use of language and concepts appropriate to individual social and cultural differences
- control of tone of voice

CNC program

is the computer-generated program selected by the operator (sub-programs, parametrics performance of CAM functions, downloading and storage of data), which translates into the CNC equipment operating automatically to fulfil its programmed instructions

Machine settings may include:

- measuring and setting equipment to:
 - stops
 - fences
 - angles
 - depths
 - feeds
 - speeds

Cutting tools may include:

- router bits
- boring or drilling bits

RANGE STATEMENT

Jigs may include:

- mortising bits
- shaped templates for routing

Disposing of may include:

- recycling unsuccessful trial runs/items that do not meet quality requirements
- re-using unsuccessful trial runs/items that do not meet quality requirements
- redirecting unsuccessful trial runs/items that do not meet quality requirements for energy recovery

Pre-startup checks

are conducted to ensure:

- equipment has been set up correctly
- cutting tools are installed accurately
- machinery operates to optimum performance

Output is to include:

- the speed or rate at which material is machined

Waste may include:

- off-cuts
- shavings
- sawdust

Records and reports may include:

- machining method
- product type and size
- inspection information
- grading and labelling outcomes
- storage locations
- quality outcomes
- hazards
- incidents
- equipment malfunctions

and may be:

- manual
- a computer-based system
- other appropriate organisational communication system

Dealing with may include:

- repairing or sending removed cutting tools for repair
- recycling removed cutting tools that cannot be repaired
- sending removed cutting tools that cannot be repaired to waste

Unit Sector(s)

Not Applicable

Competency field

Competency field	Common Technical
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