



Australian Government

Department of Education, Employment and Workplace Relations

FPITMM5205B Optimise CNC operations

Release: 1

FPITMM5205B Optimise CNC operations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor

This unit describes the outcomes required to analyse production orders, production histories and machine capabilities and to manipulate machine control programs to optimise production performance for computer numerically controlled (CNC) sizing machines, and CNC machining and processing centres

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 FPITMM5205A Optimise CNC operations

Application of the Unit

Application of the unit

The unit involves optimising software for computer numerical controlled machines in a forest products factory environment

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

Prerequisite units

Prerequisite units

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. Establish optimal operating conditions	1.1. Applicable Occupational Health and Safety (OHS), environmental, legislative and organisational requirements relevant to optimising software for CNC machines are identified and followed 1.2. Production potential of system components are assessed 1.3. Production orders and plans are analysed to identify sustained production requirements 1.4. Integration options are identified and analysed to establish the optimal integration model 1.5. Software and programming requirements to attain and sustain optimal integration are assessed and recorded 1.6. Communication with others is established and maintained in line with OHS requirements
2. Prepare for software installation	2.1. Program format and operational purpose are accurately diagnosed and specified applications identified 2.2. Specifications are checked for intended operating conditions 2.3. Program instructions are checked to make sure they follow specifications 2.4. Software timers are counter set to specification
3. Install and integrate automatic process machine control programs	3.1. Appropriate program loading technique is selected 3.2. External loading devices are correctly connected to automatic process machine control system 3.3. Machine control system is placed in correct operational mode to accept program loading 3.4. Program is downloaded in line with manufacturers' recommended procedures and enterprise requirements 3.5. Checks are made during and after downloading to ensure accurate and complete data transfer 3.6. External program loading devices and connections are disconnected from process and machine control system 3.7. Integration protocols and actions are completed
4. Commission automatic process and machine control	4.1. Operation of the equipment using the program is monitored for accuracy and safe performance 4.2. Outputs are checked and measured to make sure

ELEMENT	PERFORMANCE CRITERIA
program	they follow specifications 4.3. External inputs are checked to make sure they follow specifications 4.4. Total operation is checked to make sure they follow specifications 4.5. Location of program master copy storage is identified 4.6. Installation and commissioning process and equipment faults are recorded and reported to appropriate personnel

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, safely optimise CNC operations
- Communication skills and interpersonal techniques sufficient to interact appropriately with colleagues and others in the workplace
- Literacy skills sufficient to accurately record and report workplace information, and maintain documentation
- Numeracy skills sufficient to estimate, measure and calculate time required to complete a task
- Problem solving skills sufficient to identify problems and equipment faults and 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 optimising software for CNC machines
- Environmental protection requirements, including the safe disposal of waste material and minimising carbon emissions
- Organisational and site standards, requirements, policies and procedures relevant to optimising software for CNC machines
- Environmental risks and hazards
- Using energy effectively and efficiently
- Using material effectively and efficiently

REQUIRED SKILLS AND KNOWLEDGE

- CNC operations and optimisation
- Software programs and installation methods
- Commissioning procedures
- 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, operation 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 optimise software for computer numerical controlled machines

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 optimising software for CNC machines
- following organisational policies and procedures relevant to optimising software for CNC machines
- effective communication and safe working practices
- optimising operations for CNC equipment within the enterprise

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

EVIDENCE GUIDE

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

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.

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
- legislation
- organisational policies and procedures
- workplace practices

Environmental requirements
may include:**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

RANGE STATEMENT

Organisational requirements may include:	• relevant industry codes of practice • duty of care • legal • organisational and site guidelines • policies and procedures relating to own role and responsibility • quality assurance • procedural manuals • quality and continuous improvement processes and standards • OHS, emergency and evacuation procedures • ethical standards • recording and reporting requirements • equipment use and maintenance and storage requirements • environmental management requirements (waste minimisation and disposal, recycling and re-use guidelines)
Optimisation of CNC machines	is the process of maximising a program to direct a piece of CNC equipment to undertake the sequence of work and maximise output
Production potential	is the capacity of CNC equipment to produce output at a faster rate and in a more efficient way based on improving program formats
Production orders may include:	• number of products to be produced • treatment to be applied (sizing or machining activity)
Integration orders are to include:	• instructions to collate two or more sets of software information established through a common identifier
Software	is the programs and other operating systems used by a computer
Communication may include:	• schedules • verbal and non-verbal language • constructive feedback • active listening • questioning to clarify and confirm understanding • use of positive, confident and cooperative language

RANGE STATEMENT

Program format is to include:	• use of language and concepts appropriate to individual social and cultural differences • control of tone of voice and body language
	• intended actions of the CNC machine • time it takes for intended CNC actions based on the limitations of the machinery and the cutters
Software timers	are the software component that schedules which activities occur at what point in the program format
External loading devices	are computers (desktop, notebook or laptop) with disk drives able to be linked to the machine control system
Machine control system	is the computerised operating controls for the CNC machine which stores and runs the program at the direction of an operator
Integration protocols are to include:	• the compatibility of two or more sets of software information being collated to form a new program without corrupting
Output	is the product intended for production, produced to the intended outcome following the program format in the intended time
External inputs	involve feeding the program from the attached computer to the machine control system which is checked for accuracy with the program master
Program master copy	• is the final approved operating program which will be used to reset the CNC machine after maintenance or recalibration of components • is stored in a safe location away from the CNC machine
Records and reports may include:	• planning and monitoring outcomes • operating logs • performance records • material movement • quality outcomes • hazards • incidents or equipment malfunctions
	and may be:

RANGE STATEMENT

- manual
- using a computer-based system or another appropriate organisational communication system

Unit Sector(s)

Unit sector No sector assigned

Co-requisite units

Co-requisite units

Competency field

Competency field Timber Manufactured Products and Timber Merchandising