



Australian Government

Department of Education, Employment and Workplace Relations

PMBTECH506B Analyse the design of products and tools

Revision Number: 1

PMBTECH506B Analyse the design of products and tools

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the impact of die/tool design on the product and process.

This competency is typically performed by experienced technicians/technologists working either independently or as part of a work team.

Application of the Unit

Application of this unit

This competency applies to technicians/technologists who work with dies/tools. The key factors are the identification of key features, their impact on the process/product and the recommendation of modifications to dies/tools.

It includes:

- describing components and functions using appropriate terminology
- interpreting drawings
- identifying design features and their impact on product
- making recommendations for improving/optimising die design.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit of competency has the prerequisites of:

- *MEM9.2B Interpret technical drawing*
- *MSAOPS401A Trial new process or product*
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Employability Skills Information

Employability Skills

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 required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT ELEMENT	PERFORMANCE CRITERIA Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.
1. Identify tool components and operating principles.	1.1 Identify the common types of tools and their advantages and limitations. 1.2 Choose appropriate tool components and systems.
2. Interpret tool drawings.	2.1 Identify tool type from drawing. 2.2 Identify tool components from drawing.
3. Identify tool and part features that affect product quality.	3.1 Recognise common product faults due to tool problems. 3.2 Identify the cause of the faults. 3.3 Recommend modifications to tool or material to rectify.
4. Identify product features that affect tool design.	4.1 Recognise good and poor product design features in terms of ease of tool design and manufacture. 4.2 Identify the critical product design features which affect the selection of an appropriate manufacturing technology. 4.3 Identify the critical product design features which affect tool design.
5. Analyse tool design.	5.1 Use the process for the design, manufacture and trialling of tools. 5.2 Use analysis and balancing tools as appropriate to examine optimum tool design. 5.3 Suggest possible improvements to tool or product design.

Required Skills and Knowledge

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

Knowledge and understanding of the materials, equipment and process sufficient to predict their interactions and their impacts on performance.

Knowledge of organization procedures and policies along with the ability to implement them within appropriate time constraints and in a manner relevant to the job.

Knowledge as a basis for solving processing and material problems including:

- interpret technical drawings and specifications for tools
- function of tool components and systems
- function of clamping/mounting/ancillary systems
- tool operating principles and adjustments
- impact of product design on tooling design
- impact of tooling design on product
- impact of tool design and material properties on productivity
- the technical strengths and weaknesses of common processing and fabrication technologies and their relative suitability for classes of products
- the economic and market features of common processing and fabrication technologies and their impact on the selection of a technology for a product
- impact of polymer and polymer compound properties on tool performance and product
- material/tool interactions
- the impact of different tool designs on product and productivity
- the temperature effects on process and product
- distinguish between types of tool designs required for different product types
- fine tune and balance (where appropriate) the tooling.

Language, literacy and numeracy requirements

This unit requires high levels of numeracy and literacy with the ability to interpret technical specifications and reports. Advanced numeracy allowing the calculation and interpretation of statistics, product formulae and process conditions is also required.

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, the range statement and the assessment guidelines for this training package.

Overview of assessment

A holistic approach should be taken to the assessment.

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

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

The critical aspects for this unit of competency is the ability to apply a thorough understanding of polymer materials, their additives and the rheological, heat and other effects of processing to the design of tools and components. This understanding of material and process interactions should also be able to be applied in the interpretation of technical specifications and drawings.

Assessment method and context

Assessment will occur on industrial tools and will be undertaken in a work-like environment. Competence in this unit may be assessed:

- using appropriate, industrial tools
- in a situation allowing for the generation of evidence of the ability to recognise, anticipate and respond to problems
 - by using a suitable simulation and/or a range of case studies/scenarios
 - through a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Specific resources for assessment

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

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. Add any 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. Where reference is made to industry codes of practice and/or Australian/international standards, the latest version must be used.

Context

This competency unit includes the analysis of dies, tools and moulds and the products made from them. It does not include moulds such as are used for composites or thermoforming. The competency does not require a knowledge of industry sectors and materials other than that in which the technician works. It assumes an understanding of the operation of all relevant equipment and processes but does not necessarily require them to be used personally.

Procedures

All operations are performed in accordance with procedures.
Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Unit Sector(s)

Not applicable.