



Australian Government

MEM19028 Select materials and new technologies for jewellery or 3D object design applications

Release: 1

MEM19028 Select materials and new technologies for jewellery or 3D object design applications

Modification History

Release 1. Supersedes and is equivalent to MEM19028A Select materials and new technologies for jewellery and 3D object design applications.

Application

This unit of competency defines the skills and knowledge required to select materials and manufacturing technologies and processes for design applications.

It includes evaluating the benefits and limitations of different materials and technologies and determining best options to meet specific requirements for individually handcrafted designs or mass production.

This unit applies to individuals involved in jewellery or object design or manufacture in a small or large-scale production context. They use and adapt technical knowledge to complete work.

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

Band: A

Unit Weight: 2

Pre-requisite Unit

MEM13015 Work safely and effectively in manufacturing and engineering

MEM16006 Organise and communicate information

Competency Field

Jewellery

Elements and Performance Criteria

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Determine job requirements	1.1 Follow standard operating procedures (SOPs) 1.2 Comply with work health and safety (WHS) requirements at all times

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	1.3 Use personal protective equipment (PPE) in accordance with SOPs 1.4 Identify job requirements from specifications
2. Select materials for jewellery or object applications	2.1 Identify properties, features and typical applications of precious metals and alloys, base metals and refractory metals used in jewellery or objects 2.2 Identify properties, features and typical applications of alternative materials used in jewellery or objects 2.3 Evaluate materials for suitability and compatibility against jewellery or object design requirements, product descriptions and drawings 2.4 Assess benefits and limitations of working with or adding alternate materials against the design brief 2.5 Identify and compare alternative options and consult with appropriate persons 2.6 Select final materials based on design requirements, principal material properties and processing requirements 2.7 Confirm selection of materials against design brief
3. Select manufacturing technologies and processes for jewellery or object applications	3.1 Identify jewellery or object manufacturing technologies and processes suitable to production and their specific applications 3.2 Assess capabilities and limitations of different technologies and processes against design brief and other design considerations 3.3 Identify and compare alternative technologies and processes and consult with appropriate persons 3.4 Select and confirm manufacturing technologies and processes against design brief
4. Finalise drawing for presentation	4.1 Organise the production of working and reference drawings in accordance with SOPs 4.2 Handle and use working and reference drawings in accordance with SOPs 4.3 Prepare required supporting information to accompany drawings

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Specifications include one or more of the following:	• drawings • job sheets • work instructions.
Features and properties include one or more of the following:	• physical properties and behaviour • visual appearance • colour • availability or rarity.
Design considerations include one or more of the following:	• cost and economic viability • policy and preference • manufacturing requirements • aesthetic value • relevance to the design proposal • practicality • safety • ergonomics • cultural and social influences • sustainability.
Appropriate persons include one or more of the following:	• supervisor • manager • trainer • mentor • team member • client.
Metals include one or more of the following:	• precious metals and alloys • base metals • refractory metals.
Alternative materials include one or more of the following:	• plastics and polymers • resins • ceramics

	• composites • synthetic materials • naturally found objects • wood • rubber • silicon • glass.
Manufacturing technologies and processes include one or more of the following:	• water jetting • laser cutting • casting (clay, vacuum or centrifugal) • pressing and stamping • forging • welding • rolling and extruding • machining • spinning • anodising and electroplating • powder coating • moulding • rapid prototyping.
Environmental requirements include one or more of the following:	• liquid waste • solid waste • emissions (gas, fumes, vapour, smoke, fugitive emissions or dust) • excessive energy and water use • excessive noise.

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM19028A Select materials and new technologies for jewellery and 3D object design applications.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>

Assessment Requirements for MEM19028 Select materials and new technologies for jewellery or 3D object design applications

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- identifying benefits and limitations of materials and manufacturing processes in achieving outcomes in jewellery or 3D object design applications
- identifying features and properties of metals and metal alloys in considering the design requirements
- selecting materials for jewellery or 3D object applications and identifying alternative materials on at least two occasions
- selecting manufacturing technologies and processes for jewellery and 3D object applications on at least two occasions
- arranging the production of working and reference drawings in accordance with SOPs.

Note: Where a volume and/or frequency is not specified, demonstration must be provided at least once.

Knowledge Evidence

Evidence required to demonstrate the required knowledge for this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include knowledge of:

- safe work practices and procedures and use of personal protective equipment (PPE)
- information sources and specialist expertise available to confirm uses and quality of materials
- properties and features and typical applications of precious metals and alloys, base and refractory metals
- design considerations when selecting materials for jewellery
- types of alternative materials
- advantages and limitations of particular materials
- properties and features and typical applications of alternative materials
- manufacturing technologies and processes suitable to jewellery or 3D object production and their advantages and limitations
- appropriate people with whom to discuss design concepts

- environmental considerations when producing jewellery or 3D objects
- drawing presentation and production techniques.
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Assessment Conditions

- Assessors must:
 - have vocational competency in selecting materials and new technologies for jewellery or 3D object design applications at least to the level being assessed with relevant industry knowledge and experience
 - satisfy the assessor requirements in the *Standards for Registered Training Organisations 2015* or its replacement and comply with the *National Vocational Education and Training Regulator Act 2011*, its replacement or equivalent legislation covering VET regulation in a non-referring state/territory as the case requires.
- Where possible, assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions. This must
- cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.
- Conditions for assessment must include access to all tools, equipment, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications.
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.
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