



**Australian Government**

# **AURMTA5003 Determine material suitability for competition vehicle components**

**Release 1**

## AURMTA5003 Determine material suitability for competition vehicle components

### Modification History

| Release   | Comment                                                                                                                                                                                                                                                                                                                     |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Release 1 | <p>Replaces AURM542216A Determine material suitability for competition vehicle component construction</p> <p>Unit code updated to meet policy requirements</p> <p>Minor changes to unit title</p> <p>Reference to OHS legislation replaced with new WHS legislation</p> <p>Licensing statement added to unit descriptor</p> |

### Unit Descriptor

|                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Unit descriptor | <p>This unit of competency covers the skills and knowledge required to determine material suitability for competition vehicle component construction. It includes determining component performance specifications, researching component operating environment, establishing material specifications for component and testing material suitability.</p> <p>Licensing, legislative, regulatory or certification requirements may apply to this unit in some jurisdictions. Users are advised to check with the relevant regulatory authority.</p> |
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## Application of the Unit

|                                |                                                                                                                                                                                                                                                                                           |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Application of the unit</b> | Work involves the production of new components from a design or existing components from a new material<br><br>Work requires individuals to demonstrate analytical and organisational ability, judgement and problem-solving skills in the management of competition vehicle construction |
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## Licensing/Regulatory Information

Not applicable.

## Pre-Requisites

| Prerequisite units |                                                                                      |
|--------------------|--------------------------------------------------------------------------------------|
| AURMTA3007         | Conduct non-destructive testing                                                      |
| MEM30012A          | Apply mathematical techniques in a manufacturing, engineering or related environment |

## Employability Skills Information

|                             |                                          |
|-----------------------------|------------------------------------------|
| <b>Employability skills</b> | 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. |
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## Elements and Performance Criteria

| ELEMENT                                                                  | PERFORMANCE CRITERIA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Establish component performance specifications                        | 1.1.Regulatory body and category rules, supplementary regulations, component supplier specifications and team instructions are used to develop component specifications including design, quality, material, equipment and quantities<br>1.2.Component operating function is confirmed<br>1.3.Component operating environment is established<br>1.4.Component performance specifications are prepared<br>1.5.Workplace health and safety (WHS) requirements, including regulatory requirements, equipment and system isolation requirements and personal protection needs are observed throughout the work                                                                                                                                  |
| 2. Establish material performance specifications                         | 2.1.Material operating function is confirmed<br>2.2.Criteria to be used in the selection of material and in the evaluation of outcomes are identified and documented<br>2.3.Benchmark specifications for material are accessed and interpreted<br>2.4.Possible legal and safety impacts of the material chosen are considered and responded to in accordance with regulatory and team obligations and practices<br>2.5.Material performance specifications are prepared and documented to industry and team standards                                                                                                                                                                                                                       |
| 3. Test material suitability against material performance specifications | 3.1.Material capable of undertaking the operating function are identified<br>3.2.The proposed material is selected following the identification, consideration and evaluation of the full range of available and relevant options<br>3.3.The selected option, including material choices and processes, is developed in detail and progressively validated against established criteria<br>3.4.Material compatibility is confirmed<br>3.5.Material is selected/constructed to component specifications<br>3.6.Test material are listed against material performance specifications<br>3.7.Material failure causes are identified<br>3.8.Testing procedures and results are documented<br>3.9.Recommendations for material usage are devised |

| ELEMENT                                                                    | PERFORMANCE CRITERIA                                                                                                                                                                                                             |
|----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4. Test component suitability against component performance specifications | 4.1.Component test procedures are determined<br>4.2.Component is tested against component performance specifications<br>4.3.Testing procedures and results are documented<br>4.4.Recommendations for component usage are devised |

## Required Skills and Knowledge

### REQUIRED SKILLS AND KNOWLEDGE

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

#### Required skills

Required skills include:

- research, collect, organise and understand information related to the suitability of material for competition vehicle components including the technical, regulatory, environmental and safety requirements
- communicate ideas and information to enable clarification of requirements, coordination of work with supervisors and other workers and the reporting of work outcomes and resolution of problems
- plan and organise activities including the development of specifications, checklists and schedules and the coordination of appropriate persons, equipment, systems and material to avoid back-tracking, workflow interruptions or wastage
- work with others to foster the team by recognising dependencies and using cooperative approaches to optimise communication, workflow and productivity
- use mathematical ideas and techniques to correctly complete measurements, calculate technical specifications, calibrate and establish test equipment and evaluate test results against pre-established criteria
- create and apply systematic problem-solving techniques to anticipate problems, avoid reworking and avoid wastage
- use workplace technology related to the management of assembly and preparation including tooling, measuring devices, equipment, calculators and computers

#### Required knowledge

Required knowledge includes:

- regulatory body and category rules and component supplier specifications
- possible legal and safety impacts of material selection
- molecular structure of material
- physical properties of fabrication material and composites of this material
- chemical properties of fabrication material and composites of this material
- material treatment processes
- causes of fabrication material degradation
- mechanical properties of fabrication material and composites of this material
- appropriateness of testing procedures to material characteristics being sought
- material and component testing procedures, both:
  - destructive
  - non-destructive
- problem-solving techniques
- supervision of WHS requirements

|                                                                                                                           |
|---------------------------------------------------------------------------------------------------------------------------|
| <b>REQUIRED SKILLS AND KNOWLEDGE</b>                                                                                      |
| <ul style="list-style-type: none"><li>• record keeping methods</li><li>• associated WHS policies and procedures</li></ul> |

## 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

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

Assessors must be satisfied that the candidate can competently and consistently:

- interpret and apply team requirements, controlling body and category rules and supplementary regulations
- correctly apply and use safety equipment and personal protective equipment
- follow task instructions, operating procedures and inspection processes to:
  - minimise the risk of injury to self or others
  - prevent damage to competition vehicle or equipment
  - achieve required outcomes within team time and quality standards
- correctly determine material suitability for a minimum of two (2) competition vehicle components. At least one (1) component must be made from metal and one (1) from a composite material. Each of the following must be covered:
  - selection, development and recording of material and component performance specifications and evaluation criteria before undertaking component production and testing
  - selection, development and validation of component production methodology, processes and specifications
  - application of the component production specifications and testing against predetermined criteria
  - recording and reporting of outcomes
- work effectively with others
- modify activities to cater for variations in workplace context and environment.

#### Context of, and specific resources for assessment

- Assessment may occur on the job or in a workplace simulated facility with process equipment, material, work instructions and deadlines.
- Access to competition vehicles and associated assembly tooling in real or simulated situations involving the

| <b>EVIDENCE GUIDE</b>       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                             | <p>application of assembly techniques and to the related computing, operational and inventory support systems.</p> <ul style="list-style-type: none"><li>• Access to material, testing equipment and fabrication equipment to confirm component appropriateness.</li><li>• Access to real or simulated work areas, material, equipment and information on work specifications, customer requirements, organisational procedures, safety procedures and regulations and quality standards.</li></ul> |
| <b>Method of assessment</b> | <ul style="list-style-type: none"><li>• Assessment methods must confirm consistency of performance over time and in a range of workplace contexts.</li><li>• Assessment should be by direct observation of tasks and questioning on underpinning knowledge.</li><li>• Assessment should be conducted over time and may be in conjunction with assessment of other units of competency.</li></ul>                                                                                                    |

## 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.

#### Components include

Components include, but are not limited to:

- competition vehicle structural (e.g. brackets, braces, roll cages, and tubs/cockpits/hulls) and operating components (linkages, suspension components and drive train components)

#### WHS requirements

WHS requirements include:

- state/territory and federal legislation
- material safety management systems
- controlling body requirements
- manufacturer specifications and local safe operating procedures

#### Legislative requirements

Work is carried out in accordance with legislative obligations (including environmental requirements), manual handling procedures and team insurance requirements

#### Material

Material may include, but is not limited to:

- metals (including alloys) and composite material (plastics, fibreglass/carbon/Kevlar based material) which may be single material or combination material

#### Tooling and equipment

Tooling and equipment may include, but is not limited to:

- hand tooling
- fabrication equipment
- measuring devices
- testing devices
- tools for calibration of measuring and testing devices
- computers and relevant software

#### Personal protective equipment

Personal protective equipment is to include that prescribed under legislation, regulations and

| RANGE STATEMENT        |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        | enterprise policies and practices                                                                                                                                                                                                                                                                                                                                                                                                                |
| Information/ documents | <p>Information/ documents may include:</p> <ul style="list-style-type: none"><li>• regulatory body and category rules</li><li>• trade/professional journals, reports and electronic sources of information</li><li>• team procedures relating to documentation, reporting, testing, calibration and communication</li><li>• component supplier specifications and assembly procedures</li><li>• test equipment supplier specifications</li></ul> |

## Unit Sector(s)

|             |            |
|-------------|------------|
| Unit sector | Motorsport |
|-------------|------------|

## Co-requisite units

Not applicable.

## Competency field

|                  |           |
|------------------|-----------|
| Competency field | Technical |
|------------------|-----------|