Australian Government

MEM22015A Source and estimate engineering materials requirements

Release 1

INDUSTRY SKILLS COUNCILS
Creating Australia's Future

MEM22015A Source and estimate engineering materials requirements

Modification History

Release 1 - New unit. Replaces MEM22006A, but not equivalent.

Unit Descriptor

This unit of competency covers the skills and knowledge required to locate and approve a materials source and estimate materials requirements against a specification or bill of materials for engineering-related operations. This includes consideration of quantities, quality and capacity of suppliers to supply in accordance with a supply plan.

Application of the Unit

The unit applies to sourcing and estimating within an engineering operation or along a value chain and can be applied to individual or team-based work. It is suitable for people working in engineering or related industries in planning, purchasing or quantity surveying functions.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

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.

Elements and Performance Criteria

1	Participate in planning and budgeting for materials resourcing in engineering operation or project	1.1	Participate in planning for materials resourcing in the context of operations, project, strategic and business plans and budgets
		1.2	Contribute to management processes, such as costing and value engineering, feasibility studies, cost-benefit and break even analysis, consideration of contract law pertaining to supply arrangements and life cycle costing
		1.3	Evaluate sustainability implications of materials and components being sourced
		1.4	Participate in the selection or development of materials information systems
		1.5	Review suitability of software packages for materials estimation and sourcing and related purposes
2	Estimate quantities	2.1	Consult with operations and project teams regarding their materials needs
		2.2	Estimate quantities against operations or project specifications, drawings and bill of materials documents
3	Contribute to the development of supply chain relations	3.1	Contribute to supply chain requirements, evaluation and management
		3.2	Assist in developing tender and contract documents

4	Locate source and confirm material suppliers	4.1	Locate source and evaluate materials suppliers against specifications
		4.2	Evaluate supply agreements, quality and delivery parameters against operation or project requirements
		4.3	Coordinate approval of samples, testing and certification in accordance with specification requirements
		4.4	Confirm or recommend suppliers according to enterprise procedures
5	Monitor and review materials and supply chain	5.1	Participate in development of performance indicators or parameters for materials supply chain
		5.2	Consult, negotiate and cooperate with suppliers in relation to supply chain efficiency improvements
		5.3	Provide feedback on quality, efficiency and continuous improvement processes to supply chain members and internal stakeholders
		5.4	Identify and monitor work health and safety (WHS) and regulatory requirements related to materials supply, transport, handling, storage and processing
		5.5	Monitor sustainability of sourced materials and coordinate responses in accordance with sustainability policy and procedures
		5.6	Apply systems thinking, constraints and contingency management, as necessary, and continuous improvement techniques
6	Report and document outcomes	6.1	Provide reports on material sourcing in accordance with procedures
		6.2	Maintain documentation on estimations, sources of supply, supply chain analysis performance, continuous improvement and training, WHS and regulatory requirements, and risk assessment

Required Skills and Knowledge

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

Required skills

Required skills include:

- planning for materials resourcing
- estimating quantities, sourcing and evaluating materials suppliers against operations or project, specifications, drawings and bill of materials
- cooperating, communicating and negotiating effectively within team and functional groups, customers and suppliers
- monitoring and evaluating purchasing budget, expenditure and cash flow, sourcing of materials, sustainability implications, supply agreements and suppliers for quality, capacity and flexibility, conformance to regulatory requirements and test procedures
- using materials sourcing and planning software packages
- contributing to organisational management processes and materials supply chain management
- developing or using materials supply tender and contract documents
- interpreting materials requirement and purchasing schedule, purchasing budgets, and performance indices for materials supply chain
- coordinating responses to budget and delivery supply threats related to materials purchases
- participating in setting and implementing supplier payment policies
- implementing systems thinking, concurrent engineering, continuous improvement, contingency and constraint management, problem solving and decision making
- determining implications for materials sourcing of WHS, risk management, codes of practice, and sustainability policy and requirements
- reporting and documenting results of evaluations, tender analysis, and so on

Required knowledge

Required knowledge includes:

- planning procedures for materials resourcing in the context of operations, project, strategic and business plans and budgets
- use of systems and software packages to assess materials requirements information, data processing, bill of materials, estimating, supplier database and purchasing budget control
- systems for cost estimation and planning, value engineering, feasibility studies, cost-benefit analysis, life cycle costing and valuation
- supply chain management and value analysis, performance indices or parameters, and monitoring processes

- tender and contract documents, supply agreements, quality and delivery parameters, and terms of payment
- supply chain communications, feedback on quality, supply chain efficiency and continuous improvement processes
- sustainability policy and procedures
- WHS, regulatory and risk management requirements with particular emphasis on handling and use of resources
- WHS and regulatory compliance requirements, material safety data sheets (MSDS), test results, and risk management related to handling and storage
- use of systems thinking, constraints and contingency management, problem solving and decision making, and continuous improvement techniques

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 source and estimate materials for an engineering operation, including interacting with the supply chain. It includes planning and estimating supplies and integrating purchasing into operations. This includes working individually and as part of a team and recognising and complying with normal control procedures on engineering projects.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently: • plan for materials resourcing • estimate quantities, source and evaluate materials suppliers • develop tender and contract documents, materials requirement and purchasing schedule, purchasing budgets, and performance indices for materials supply chain • participate, communicate, cooperate, and negotiate with stakeholders on policy and procedures development and implementation • monitor supply of materials against contract requirements and key performance indicators (KPIs) • contribute to organisational management processes, and materials supply chain management.
Context of and specific resources for assessment	• This unit may be assessed on the job, or a combination of both on and off the job. The candidate should have access to a workplace where the engineering-related production or project

	processes and volume of materials used enable the materials sourcing skills covered by this unit to be realistically assessed. Where part of assessment occurs off the job a simulated working environment must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. • Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability. • 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.
Method of assessment	• Assessment must satisfy the endorsed Assessment Guidelines of the MEM05 Metal and Engineering 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 underpinning knowledge. • Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure correct interpretation and application. • 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 not only able 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 where required.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.

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.

Sustainability implications	Sustainability implications for sourcing and estimating materials in engineering or engineering-related operations may include taking account of: • resource consumption • energy consumption and conservation • processing needs • minimisation and processing of waste • transport • distribution • life cycle • reuse, recycle and disposal
Materials	Materials covered by this unit are those required for the ongoing production or performance of an engineering-related project or operation and must meet an engineering specification and for which the delivery must be coordinated with a production or project schedule. The materials will typically be subject to formal supplier agreements or contracts and delivery is to specified cost, times, quality and quantities
Supplier performance	Supplier performance may include: • cost • delivery reliability • conformance to quality and quantity specifications • conformance to contract and regulatory requirements • participation in efficiency improvement processes • flexibility
Software packages	Software packages may include: • spreadsheets • databases • word processor • presentation • project management and cost control • system control and data acquisition (SCADA), MRPII and enterprise resource planning (ERP)
Systems thinking	Systems thinking refers to the conduct of engineering work in a manner that demonstrates knowledge of how the interaction of different technical systems on equipment, machinery or structures, as well as the skills and techniques of personnel, combine to perform or support engineering-related operations, processes or projects. It embraces determining or establishing how the function of each technical system or component, as well as the skills and techniques of personnel, effects or potentially may effect, outcomes. Systems

	should be interpreted broadly within the context of the organisation and depending on the project or operation can include equipment, related facilities, material, software, internal services and personnel, and other organisations in the value chain
Constraints and contingencies	Contingencies and constraints may include: • financial • sudden changes to schedules or delivery by a supplier • organisational, procedural or cultural • physical constraints, such as limits to resources, limits to site access or logistical limitations
Continuous improvement implementation	Improvement processes may include techniques, such as: • balanced scorecard • current and future state mapping • measuring performance against benchmarks • process improvement, problem solving and decision making • data management, generation, recording, analysing, storing and use of software • training for improvement systems participation • technical training
WHS, regulatory requirements and enterprise procedures	WHS, regulatory requirements and enterprise procedures may include: • WHS Acts and regulations • relevant standards • codes of practice from Australian and overseas engineering and technical associations and societies • risk assessments • registration requirements • safe work practices • state and territory regulatory requirements
Standards and Codes	Standards and codes refer to all relevant Australian and international standards and applicable codes
MSDS	Organisations using or storing hazardous substances or dangerous goods are required to maintain a MSDS and dangerous goods register. Manufacturers or importers of hazardous substances are obliged to provide an MSDS whenever the substances are first supplied to a customer

Unit Sector(s)

Competency field

Unit sector Management and organisation

Custom Content Section

Not applicable.