



Australian Government

MEM23149A Contribute to the design of commercial and industrial exhaust systems

Release: 1

MEM23149A Contribute to the design of commercial and industrial exhaust systems

Modification History

Release 1 (MEM05v9).

Unit Descriptor

This unit of competency covers the skills and knowledge required to contribute to the design of commercial and industrial exhaust systems, including industrial dust extraction systems or for less complex systems to undertake the complete design.

Application of the Unit

The unit applies to technicians in enterprises that design whole commercial and industrial exhaust systems or undertake design modifications to existing systems as part of manufacturing, installation, commissioning, servicing and maintenance activities.

The unit applies to design work undertaken as part of a design team comprising engineers and other technicians and to individual design tasks within the technician's skill and knowledge.

Licensing/Regulatory Information

The following licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Pre-Requisites

MEM23004A Apply technical mathematics

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

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|---|--|-----|---|
| 1 | Determine commercial and industrial exhaust system requirement | 1.1 | Obtain and implement work health and safety (WHS) and environmental requirements for a given work area |
| | | 1.2 | Determine requirements for a commercial and industrial exhaust system using relevant standards, codes and authority information |
| | | 1.3 | Consult appropriate personnel to ensure that work is coordinated effectively with others |
| | | 1.4 | Obtain equipment and resources needed for the task in accordance with enterprise procedures |
| 2 | Design exhaust system | 2.1 | Prepare design and drawings for commercial and industrial system scenarios according to enterprise procedures |
| | | 2.2 | Plan design development work to meet scheduled timelines |
| | | 2.3 | Provide solutions to unplanned situations consistent with enterprise procedures |
| 3 | Document design | 3.1 | Validate specifications of exhaust system designed for meeting all relevant standards and codes for intended application |
| | | 3.2 | Verify final design using enterprise procedures for compliance and regulatory requirements |
| | | 3.3 | Prepare final system design documents to industry |

standards for client approval

Required Skills and Knowledge

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

Required skills

Required skills include:

- interpreting requirements and specifications
- determining performance aspects of system
- applying noise abatement measures
- balancing fan duct systems
- using relevant drafting software tools effectively
- interpreting drawings and specifications
- communicating effectively with others
- communicating technical and procedural requirements to others
- documenting technical information and designs
- dealing effectively with unexpected situations
- working in teams with others

Required knowledge

Required knowledge includes:

- relevant codes and regulations
- system types
- duct design
- fluid dynamics including laminar and turbulent flow, friction and pressure loss
- outlet design and location, including consideration of:
 - environmental requirements
 - noise
 - access protection against pests
- cycling/operation control
- dust collection and control, including:
 - filter types
 - cyclone and shaker type collectors
- motor ratings
- fan types
- noise control
- sound proofing
- flame proofing

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.

<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>Assessors must be satisfied that the candidate can competently and consistently:</p> <ul style="list-style-type: none"> • implement WHS workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range • demonstrate essential knowledge and skills to design commercial and industrial exhaust systems • demonstrate competence within a timeframe typically expected of the discipline, work function and industrial environment • demonstrate the ability prepare the design, drawings and specifications of a variety of exhaust systems. This must be demonstrated consistently on two (2) different systems • demonstrate the ability to design commercial and industrial exhaust systems consistent with codes and regulations. This must be demonstrated consistently on different systems.
<p>Context of and specific resources for assessment</p>	<ul style="list-style-type: none"> • This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, then an appropriate simulation 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. The assessment environment should not disadvantage the candidate.
<p>Method of assessment</p>	<ul style="list-style-type: none"> • 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

	<p>application.</p> <ul style="list-style-type: none"> • 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.

WHS requirements	<p>WHS requirements include:</p> <ul style="list-style-type: none"> • legislation • protective equipment • material safety management systems • hazardous substances and dangerous goods code • local safe operation procedures • awards provisions
Environmental requirements	<p>Environmental requirements include:</p> <ul style="list-style-type: none"> • relevant legislation, regulations and codes • correct handling and disposal of liquid and solid waste • elimination or minimisation of gas, fume, vapour and smoke emissions, including fugitive emissions • dust elimination, minimisation and control • minimisation of energy and water use • elimination or control of excessive noise • use and recycling of refrigerants
Appropriate personnel	Appropriate personnel may include:

	<ul style="list-style-type: none"> • supervisor • leading hand • foreman • manager • engineer • technician • trainer • mentor • team member • customer • client
Commercial and industrial exhaust system	<p>An enterprise system could be inclusive of any or all of the following:</p> <ul style="list-style-type: none"> • dust • fumes • explosive gases • noxious gases
Resources	<p>Resources may include:</p> <ul style="list-style-type: none"> • relevant codes and manufacturer specifications
Enterprise procedures	<p>Enterprise procedures may include:</p> <ul style="list-style-type: none"> • the use of tools and equipment • instructions, including job sheets, plans, drawings and designs • reporting and communication • manufacturer specifications • operational procedures • industry standards
Equipment	<p>Equipment may include:</p> <ul style="list-style-type: none"> • computer workstation and software, either stand alone or networked • test apparatus • appropriate tools of trade, equipment and materials

Unit Sector(s)

Competency field

Unit sector Engineering science

Custom Content Section

Not applicable.