

| | | | | |
|-------------------------|--|--------------|-----------------------|------------------------------------|
| Training Package | Metal and Engineering (MEM98) | | | HSC Requirements and Advice |
| Title | Manual soldering/desoldering - electrical/electronic components | | | |
| Unit code | Unit Weight | Field | Band | HSC Indicative Hours |
| MEM5.1AA | 4 | Fabrication | Specialisation band A | 20 |

| Evidence Guide | | HSC Requirements and Advice |
|------------------------------|---|---|
| Assessment context | This unit may be assessed on the job, off the job, or a combination of on and off the job. 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. | Key Terms and Concepts <ul style="list-style-type: none"> • align, clamp and mount • cleaning • communication • component protection procedures • desoldering • fluxes • general features, purpose and application of tools and equipment • inspection procedures • jointed/joints • materials handling • minimise damage • occupational health and safety (OHS) • physical handling and stress relief methods • preparation requirements • recording and reporting • safe and efficient work environment • safe work practices • solder |
| Assessment conditions | <p>The candidate will be provided with:</p> <ul style="list-style-type: none"> • all tools, equipment, material and documentation required. <p>The candidate will be permitted to refer to the following documents:</p> <ul style="list-style-type: none"> • any relevant workplace procedures • any relevant product and manufacturing specifications. <p>The candidate will be required to:</p> <ul style="list-style-type: none"> • orally, or by other methods of communication, answer questions put by the assessor • identify colleagues who can be approached for the collection of competency evidence where appropriate • present evidence of credit for any off-job training related to this unit. <p>Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.</p> | |
| Critical aspects | This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with manual soldering and desoldering or other competencies requiring the exercise of the skills and knowledge covered by this unit. | |

| Evidence Guide | | HSC Requirements and Advice |
|-----------------------|--|---|
| Special notes | <p>During assessment, the individual will:</p> <ul style="list-style-type: none"> • demonstrate safe working practices at all times; • communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment; • take responsibility for the quality of their own work; • plan tasks in all situations and review task requirements as appropriate; • perform all tasks in accordance with standard operating procedures; • perform all tasks to specifications; • use accepted engineering techniques, practices, processes and workplace procedures. <p>Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.</p> | <ul style="list-style-type: none"> • soldering • soldering techniques • specifications • standard operating procedures. |

Range Statement

This unit covers manual soldering/desoldering for the installation and fabrication of electrical/electronic components.

Work undertaken in a production or maintenance environment using predetermined standards of quality, safety and work procedures.

Component protection procedures are predetermined.

Correct and appropriate soldering tools and equipment may include all types of soldering irons, cutters, brushes, files, soldering tips, solder syringes, holding devices etc.

Correct and appropriate materials may include solder (solid resin cord and paste), flux (resin or powder) etc.

All materials and procedures specified via job instructions.

Inspections carried out using visual, mechanical or electric techniques with pre-setup equipment.

All work undertaken to legislative and regulatory requirements.

Depending on the actual soldering job, hand and power tools and measuring skills may be required. These are covered by other units such as Unit 18.1A (Use hand tools), Unit 18.2A (Use power tools/hand held operations) and appropriate measurement units.

Handling refers to methods of physical handling and stress relief methods of preventing damage caused by electrostatic discharge. This may include wrist straps and anti-static work areas and practices.

This unit does not include skills in silver soldering or brazing skills. These skills are covered in Unit 5.6A (Perform brazing and/or silver soldering). Where soldering and desoldering is limited to the straightforward termination, disconnection or reconnection of electrical wiring then see Unit 10.2A (Terminate and connect electrical wiring). Advanced specification and high reliability soldering associated with the installation of electrical/electronic components, in areas where reliability of connections is critical, is covered by Unit 5.2A (High reliability soldering and desoldering).

| Element | Performance Criteria | Assessor Guide | | HSC Requirements and Advice |
|-----------------------------------|--|---|--|---|
| | | To observe that | To confirm that | |
| 1 Prepare materials for soldering | 1.1 Materials preparation instructions understood and followed. | Materials are prepared for soldering in accordance with instructions and work site procedures. | <p>The preparation requirements of materials prior to soldering can be identified.</p> <p>The consequences of incorrect material preparation prior to soldering can be given.</p> | <p>Learning experiences for the HSC must address:</p> <p>Knowledge of soldering equipment required for the installation, maintenance and fabrication of electrical/electronic components and cabling which may be used to support a production in the entertainment industry.</p> <p>Awareness of occupational health and safety (OHS) issues in relation to soldering and desoldering.</p> <p>Documentation outlining job instructions and processes including:</p> <ul style="list-style-type: none"> • job sheet/specifications • standard operating procedures (SOP) • production plan. |
| | 1.2 Materials prepared using correct soldering tools, equipment, materials and procedures. | Appropriate tools are used in the preparation of materials for soldering in accordance with work site procedures. | <p>The correct application of a range of soldering tools and equipment can be given.</p> <p>The applications of different solders and fluxes with respect to the materials to be soldered can be identified.</p> | <p>Learning experiences for the HSC must address:</p> <p>Preparation requirements for materials prior to soldering.</p> <p>General features, purpose and correct use of a range of tools and equipment including:</p> <ul style="list-style-type: none"> • soldering irons • cutters • brushes • files • soldering tips • solder syringes • holding devices. <p>Application of different solders and fluxes with respect to materials to be soldered including:</p> <ul style="list-style-type: none"> • solders including <ul style="list-style-type: none"> - solid - resin cord - paste • fluxes including <ul style="list-style-type: none"> - resin - powder. |

| Element | Performance Criteria | Assessor Guide | | HSC Requirements and Advice |
|--------------------|--|--|--|--|
| | | To observe that | To confirm that | |
| | 1.3 Materials prepared to specifications using instruction or standard operating procedures. | The materials to be soldered are prepared to specification and in accordance with work site procedures. | The material preparation requirements can be identified. | Learning experiences for the HSC must address: An understanding of terminology found in material specifications and operating procedures. |
| 2 Solder materials | 2.1 Correct soldering techniques, procedures, materials and soldering tools selected. | An appropriate soldering technique is selected in accordance with work site procedures. The correct tools and materials are selected in accordance with work site procedures. | Examples of alternative soldering techniques and their application can be given. | Learning experiences for the HSC must address: A range of soldering techniques for a variety of materials and work tasks in the entertainment industry. Awareness of physical handling and stress relief methods for preventing damage caused by electrostatic discharge, including use of: <ul style="list-style-type: none"> • wrist straps • antistatic <ul style="list-style-type: none"> - work areas - work practices. |
| | 2.2 Materials to be jointed, mounted, shaped to specification using standard operating procedures. | Where appropriate, materials to be jointed are aligned, clamped and mounted as necessary prior to soldering, in accordance with work site procedures. | The required relationship between the parts to be jointed can be identified. | Learning experiences for the HSC must address: Techniques to align, clamp and mount materials to be jointed. |
| | 2.3 Solder applied using correct and appropriate techniques. | An appropriate soldering technique is used to apply solder to the materials to be jointed, in accordance with work site procedures. | | Learning experiences for the HSC must address: Knowledge of: <ul style="list-style-type: none"> • consequences of incorrect material preparation and technique • safe soldering technique • how to apply different solders and fluxes • safety precautions • need for adequate ventilation • component protection procedures. Awareness of legislative/regulatory requirements for work undertaken. |
| | 2.4 Where appropriate, excess material removed using correct and appropriate tools and techniques. | Where appropriate, excess solder is removed in accordance with work site procedures. | Methods of solder removal and their application can be identified. | Learning experiences for the HSC must address: Knowledge of solder removal techniques and their application. Tools and techniques for cleaning solder from materials/devices. |

| Element | Performance Criteria | Assessor Guide | | HSC Requirements and Advice |
|-------------------------|--|---|---|--|
| | | To observe that | To confirm that | |
| | 2.5 Procedures for the protection of components observed according to standard operating procedure. | Work site procedures for the protection of components are followed. | Component protection procedures can be described. | |
| 3 Inspect solder joints | 3.1 Inspection procedure undertaken to standard operating procedures. | Work site inspection procedures are followed. | The inspection procedures for soldered joints can be identified. | <p>Learning experiences for the HSC must address:</p> <p>Importance of:</p> <ul style="list-style-type: none"> • taking responsibility for the quality of own work • using accepted engineering techniques, practices, processes and workshop procedures. <p>Standard operating procedures (SOP) for inspection of soldered joints using visual, mechanical or electric techniques with pre-set equipment.</p> <p>Identification of correct and incorrect:</p> <ul style="list-style-type: none"> • soldering procedures • soldered work. |
| | 3.2 Inspection results reported/recorded to standard operating procedures as required. | Inspection results are recorded/reported in accordance with work site procedures. | The information to be recorded and the frequency of recording can be identified. | <p>Learning experiences for the HSC must address:</p> <p>Recording and reporting:</p> <ul style="list-style-type: none"> • informal/formal • verbal/written. |
| 4 Undertake desoldering | 4.1 Correct and appropriate techniques, procedures, desoldering tools and equipment selected. | Appropriate desoldering tools and equipment are selected in accordance with work site procedures. | <p>Desoldering techniques and procedures can be identified.</p> <p>The applications of different desoldering techniques/ procedures can be given.</p> | <p>Learning experiences for the HSC must address:</p> <p>A range of desoldering techniques for a variety of materials and work tasks in the entertainment industry.</p> |
| | 4.2 Materials/components de-soldered using correct procedure minimising damage to materials, components. | <p>Materials/components are de-soldered in accordance with work site procedures.</p> <p>Damage to materials/ components is minimised through the application of appropriate work site procedures.</p> | Methods of minimising damage to materials/components can be identified. | <p>Learning experiences for the HSC must address:</p> <p>Standard operating procedures (SOP) to minimise damage to materials and components.</p> |

| Element | Performance Criteria | Assessor Guide | | HSC Requirements and Advice |
|---------|--|---|---|---|
| | | To observe that | To confirm that | |
| | 4.3 Material/device removed and cleaned to specifications using standard operating procedures. | The material/device is removed and cleaned in accordance with work site procedures. | <p>The methods of cleaning solder from materials/devices can be identified.</p> <p>The applications of different cleaning methods can be given.</p> | <p>Learning experiences for the HSC must address:</p> <p>Equipment and techniques needed to clean components/materials/devices.</p> <p>Awareness of safe work practices when cleaning.</p> |