Australian Government

Department of Education, Employment and Workplace Relations

MEM05052A Apply safe welding practices

Release: 1

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Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers identifying risks associated with welding operations and implementing hazard reduction practices.

Application of the Unit

Application of the unit	This unit applies to gas and electric arc welding. It includes the identification of risks associated with welding all commonly used metals and implementation of techniques used to reduce or eliminate welding hazards. **Band**: **A** **Unit Weight**: **4**

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	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.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Access and interpret OH&S information	1.1. OH&S information is obtained and interpreted. 1.2. Relevant OH&S legislation is identified. 1.3. Work related safety information is obtained and interpreted.
2. Identify risks associated with welding	2.1. Pollutants formed by welding processes are identified. 2.2. Occupational diseases and injuries which may be associated with welding are identified. 2.3. Factors associated with increased risk are identified. 2.4. Exposure levels for pollutants are identified. 2.5. Risks and potential health effects associated with specific metals are identified. 2.6. Risks and potential health effects associated with gases in welding are identified. 2.7. Other hazards of welding are identified.
3. Reduce risks associated with welding	3.1. Manual handling techniques are used. 3.2. Personal protective equipment is used correctly. 3.3. Procedures to control hazards are implemented. 3.4. Workplace safety procedures are implemented. 3.5. Workplace safety non-compliances are reported in accordance with workplace procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: • sourcing and interpreting safety-related information and Material Safety Data Sheets (MSDS) • planning and sequencing operations • identifying workplace risks and nonconformances • reporting workplace risks and nonconformances • checking and clarifying task-related information

REQUIRED SKILLS AND KNOWLEDGE

Required knowledge

Look for evidence that confirms knowledge of:

- characteristics and properties of common metals and welding materials
- effect of gas and electrical welding operations on metals
- hazards and control measures associated with gas and electrical welding, including housekeeping
- welding safety practices and procedures
- effect of various treatments on a range of commonly used metals
- use and application of personal protective equipment

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	A person who demonstrates competency in this unit must be able to apply safe welding practices.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	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, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	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, that is the candidate is not in productive work, 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. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with applying safe welding practices or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

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.	
OH&S information	• National Occupational Health and Safety Commission guidelines • Organisational OH&S practices and procedures manuals • Australian/New Zealand and ISO standards • Company risk management policy • Codes of practice • Australian dangerous goods legislation • Trade practices • Occupational Health and Safety reporting requirements • Weld procedures
Work related safety information	• Standard operating procedures • Material safety data sheets (MSDSs) • Job sheets • Emergency procedures • Safety standards and procedures
Pollutants	• Nitrogen oxides • Ozone • Metal fumes etc. • Lead oxide • Silicon oxide • Calcium fluoride • Calcium oxide • Magnesium oxide • Sodium oxide • Potassium oxides • Carbon dioxide • Organics • Iron

RANGE STATEMENT	
	• Manganese • Calcium carbonate • Zirconium oxide • Titanium oxide • Hexavalent chromium
Occupational diseases and injuries	• Eye injuries • Skin damage • Respiratory irritations • Chronic effects • Allergies
Factors	• Gas leakage from cylinders • Type of consumable and metals used • Type of welding processes • Type of electrodes • Welding current • Voltage and amperage • Ventilation • Contamination • Interaction of chemicals • Exposure levels • Flammability
Exposure levels	• Time Weighted Average • Short Term Exposure Limit (STEL) • Maximum Allowable Concentration (MAC) or Threshold Limit Value - Ceiling (TLV-C) • Skin Notation
Specific metals	• Aluminium • Antimony • Arsenic • Beryllium • Boron • Cadmium • Chromium • Copper • Cobalt • Iron • Lead • Lithium • Magnesium • Manganese

RANGE STATEMENT	
	• Mercury • Molybdenum • Nickel • Platinum • Selenium • Silver • Thorium • Tin • Titanium • Tungsten • Vanadium • Zinc • Zirconium
Gases	• Acetylene • Argon • Carbon dioxide • Carbon monoxide • Helium • Nitrogen oxides • Ozone • Phosgene • Phosphine • Stibine
Other hazards	• Fluxes • Electro-magnetic radiation • Electric shock • Sparks • Spatter • Contaminated and coated metals • Gas cylinder and electrical hazards • Confined spaces • Noise • Chemical exposure • Solvents • Musculoskeletal, back and overuse injuries • Vibration • Dusts • Heat stress • Ultraviolet radiation • Airborne pollutants

RANGE STATEMENT	
	• Flammable gases • Infrared radiation • Thermal damage
Manual handling techniques	• Housekeeping practices • Lifting weight limits • Appropriate storage • Use of lifting devices • Appropriate training • Hazardous materials storage standards and procedures
Personal protective equipment	• Respirators • Ear muffs • Protective clothing • Gloves • Boots • Helmets • Eye protection • Face shields
Procedures to control hazards	• Substituting hazardous materials with safer materials • Changing workplace design to eliminate hazards • Modifying work practices to reduce exposure • Using personal protective equipment • Using adequate and appropriate ventilation
Workplace safety measures	• Shielding requirements • Ventilation • General and diluted • Local exhaustion • Use of personal protective equipment • Checking equipment condition • Equipment maintenance • Correct operation of equipment • Correct voltage and electrical connections • Good posture • Fire safety, plant and equipment isolation • Communications with appropriate personnel

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication