



Australian Government

Department of Education, Employment and Workplace Relations

MSL963002A Repair glass apparatus using simple glassblowing equipment

Revision Number: 1

MSL963002A Repair glass apparatus using simple glassblowing equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the ability to perform basic repairs to glass apparatus using simple glassblowing equipment. It includes the ability to assess the economics of salvage and to follow a procedure of disassembly/assembly of the apparatus in accordance with specifications.
------------------------	--

Application of the Unit

Application of the unit	This unit of competency is applicable to scientific glassblowers. It covers work that will sometimes be performed by less experienced workers under the guidance of an experienced scientific glassblower. Industry representatives have provided case studies to illustrate the practical application of this unit of competency and to show its relevance in a workplace setting. These are found at the end of this unit of competency under the section 'This competency in practice'.
--------------------------------	--

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		
	MSL963001A	<i>Operate basic handblowing</i>

Prerequisite units		
		<i>equipment</i>

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. Prepare for repair operations	1.1. Identify job, appropriate procedure, hazards and safety requirements, and apparatus required 1.2. Establish correct cleaning procedure for contaminated glassware before commencing repair operations 1.3. Use personal protective equipment and safety procedures as specified for job and materials to be used 1.4. Record job description, compare with blueprint, drawing, sketch, design or similar specification and report perceived difficulties 1.5. Prepare equipment for repair in accordance with job requirements 1.6. Identify, select and prepare glass stocks and components for job
2. Repair apparatus	2.1. Check and adjust equipment and tools for job requirements 2.2. Check and adjust equipment and tools for the job 2.3. Start up equipment using enterprise procedures 2.4. Follow supplied designs and enterprise procedures to perform the repairs required 2.5. Follow equipment shutdown procedures
3. Operate annealing equipment	3.1. Prepare annealing equipment for the job 3.2. Start up, operate and shut down annealing equipment using enterprise procedures 3.3. Monitor, adjust and record annealing operation 3.4. Rectify routine problems
4. Maintain a safe work environment	4.1. Follow established safe work practices to ensure safety of self and other workers 4.2. Minimise the generation of wastes 4.3. Ensure the safe disposal of wastes 4.4. Clean, care for and maintain work area, equipment and tools 4.5. Report hazards and incidents according to enterprise procedures
5. Maintain records	5.1. Record data as per enterprise requirements 5.2. Maintain equipment logs as per enterprise requirements 5.3. Maintain security and confidentiality of enterprise

ELEMENT	PERFORMANCE CRITERIA
	information

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- determining types of contaminants present on/in apparatus
- cleaning techniques for contamination carried out before repair operations are undertaken
- using appropriate treatment processes, with particular attention to risks associated with blowing used and possibly contaminated glass
- reading and following blueprints, drawings, sketches and designs relevant to repair work
- selecting appropriate grades of glass and preparing for use
- preparing apparatus for repair
- optimising and using glassblowing equipment
- identifying atypical or out of normal repair problems
- reporting problems to either supervisor or outside service technician according to enterprise procedures
- recording and communicating work results
- following correct occupational health and safety (OHS) and principles of good laboratory practice (GLP)

Required knowledge

Required knowledge includes:

- relevant glassblowing techniques
- the risks associated with blowing used and contaminated glass
- contamination cleaning techniques to be carried out before repair operations are undertaken
- use and function of the broken apparatus
- repair materials and reason for their choice
- use of appropriate tools and equipment
- basic chemical and physical concepts related to behaviour of glass under heat and stress
- basic knowledge of how apparatus to be repaired is used
- critical material properties and appropriate glassworking parameters
- pre-repair apparatus preparation procedures
- annealing procedures
- methods of minimising potential quality problems
- relevant health, safety and environment requirements

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 should ensure that candidates can:

- safely repair glass apparatus following enterprise procedures
- assess the economics of salvage
- follow a procedure of disassembly/assembly of apparatus in accordance with specifications
- apply contamination cleaning techniques before repair operations are undertaken
- report problems to appropriate personnel.

Context of and specific resources for assessment

This unit of competency is to be assessed in the workplace or simulated workplace environment.

This unit of competency may be assessed with:

- *MSL963001A Operate basic handblowing equipment.*

Resources may include:

- access to a scientific glassblowing facility, appropriate equipment, materials and procedures
- a bank of case studies where these form part of the assessment method.

Method of assessment

It is strongly recommended that assessment is conducted through observation over time. The timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical additional assessment techniques must be used.

The following assessment methods are suggested:

- inspection of glasswork and workplace documentation completed by the candidate
- analysis of work completed over a period of time to ensure accurate and consistent work is obtained within required timelines.
- feedback from peers and supervisors
- use of suitable simulation and/or a range of case studies/scenarios.

EVIDENCE GUIDE

	In all cases, practical assessment should be supported by questions to assess underpinning knowledge and those aspects of competency which are difficult to assess directly. 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. The language, literacy and numeracy demands of assessment should not be greater than those required to undertake the unit of competency in a work like environment.
This competency in practice	Industry representatives have provided the case study below to illustrate the practical application of this unit of competency and show its relevance in a workplace setting. Education A trainee glassblower has been asked by his/her supervisor to repair several pieces of used and broken laboratory glassware as part of a cost saving exercise. Firstly, he/she determines whether the glassware will be used for general tasks or for qualitative analysis and how urgently the job is required. He/she then clarifies whether any hazardous material has been used in the equipment and applies the correct cleaning procedures. After determining the nature of the glass and the appropriate glassworking parameters, he/she repairs the equipment using safe apparatus. Finally the glassblower subjects the equipment to the appropriate annealing/conditioning process and checks the final outcome with his/her supervisor. Any contaminated or used glass waste is disposed of appropriately.

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.

Codes of practice

Where reference is made to industry codes of practice, and/or Australian/international standards, it is expected the latest version will be used

Standards, codes, procedures and/or enterprise requirements

Standards, codes, procedures and/or enterprise requirements may include:

- calibration and maintenance schedules
- enterprise recording and reporting procedures
- equipment manuals
- equipment startup, operation and shutdown procedures
- industry codes of practice
- material safety data sheets (MSDS)
- material, production and product specifications
- national environment protection measures
- OHS national standards and codes of practice
- production and laboratory schedules
- quality manuals
- standard operating procedures (SOPs)

Tools, materials and equipment

Tools, materials and equipment may include:

- burners, gas supplies and gas economisers
- glassworking lathes
- mechanical glass cutters and saws
- mechanical glass grinding equipment
- annealing ovens
- measuring and recording equipment
- hand tools, such as carbon paddles and mandrels, range of forceps, glass tubing gauges, angle setting jigs, calipers, glass support rollers, brass shapers, carbon rods, glass knife, stainless steel gauze, vernier calipers and other measuring tools, and strain viewer

RANGE STATEMENT	
	• various glass types, including soda-lime, borosilicate, quartz, silica and special formula glasses • glass to metal seals • communication equipment
Hazards	Hazards may include: • sharps and broken glassware • heat sources, such as burners and ovens • fluids under pressure (acetylene and oxygen) • glass dust • cuts associated with glass grinders and cutters • manual handling of heavy sample bags and containers
Safe work practices	Safe work practices may include: • use of personal protective equipment, such as heat resistant gloves, safety glasses, goggles, face guards, coveralls, respirators and safety boots • correct labelling of reagents and hazardous materials • handling, and storing hazardous materials and equipment in accordance with labels, MSDS, manufacturer's instructions, and enterprise procedures and regulations • regular cleaning and/or decontamination of equipment and work areas
Occupational health and safety (OHS) and environmental management requirements	OHS and environmental management requirements: • all operations must comply with enterprise OHS and environmental management requirements, which may be imposed through state/territory or federal legislation - these requirements must not be compromised at any time • all operations assume the potentially hazardous nature of samples and require standard precautions to be applied • where relevant, users should access and apply current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and

RANGE STATEMENT

	State and Territory Departments of Health
--	---

Unit Sector(s)

Unit sector	Scientific glassblowing
--------------------	-------------------------

Competency field

Competency field	
-------------------------	--

Co-requisite units

Co-requisite units		