



**Australian Government**

# **MSL965003 Construct, modify and maintain high vacuum systems**

**Release: 1**

# **MSL965003 Construct, modify and maintain high vacuum systems**

## **Modification History**

Release 1. Supersedes and is equivalent to MSL965003A Construct, modify and maintain high vacuum systems

## **Application**

This unit of competency covers the ability to construct, monitor, modify and maintain high vacuum systems. Personnel are required to use advanced bench/hand glasswork techniques and equipment to fabricate glass apparatus.

This unit of competency is applicable to skilled and experienced scientific glassblowers. They will apply specialised technical knowledge and precise technical skills and considerable planning and judgement in their work.

While no specific licensing or certification requirements apply to this unit at the time of publication, laboratory operations are governed by relevant legislation, regulations and/or external accreditation requirements. Local requirements should be checked.

## **Pre-requisite Unit**

MSL963001 Operate basic handblowing equipment

MSL963002 Repair glass apparatus using simple glassblowing equipment

## **Competency Field**

Scientific glassblowing

## Unit Sector

### Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1	<b>Construct high vacuum systems</b>	1.1	Consult with clients regarding design specifications and cost
		1.2	Identify or prepare appropriate blueprints, drawings, sketches and designs
		1.3	Identify hazards and workplace safety requirements
		1.4	Prepare equipment in accordance with job requirements
		1.5	Construct and install vacuum apparatus
		1.6	Trial and commission vacuum apparatus
		1.7	Use leak detection equipment to vacuum check system
		1.8	Complete records and file in the reporting system
2	<b>Modify high vacuum systems</b>	2.1	Identify opportunities to improve efficiency of vacuum system
		2.2	Use leak detection equipment to vacuum check system
		2.3	Identify gaps and deficiencies which limit system's usefulness
		2.4	Confirm modification requirements with appropriate personnel
		2.5	Modify system to meet requirements
3	<b>Maintain high vacuum systems</b>	3.1	Identify maintenance procedures and appropriate records
		3.2	Plan and evaluate maintenance according to appropriate quality standards
		3.3	Identify, document and report need for maintenance for faulty or damaged equipment

- 3.4 Maintain vacuum and associated systems according to standard procedures
    - 3.5 Use leak detection equipment to vacuum check system
- 4 **Monitor and finetune vacuum operation**
  - 4.1 Monitor system to determine whether equipment is operating to specification
  - 4.2 Evaluate equipment outputs to determine nature of problem
  - 4.3 Define nature of sub-standard performance clearly
  - 4.4 Fine tune system to restore system to specification
- 5 **Maintain a safe work environment**
  - 5.1 Use established safe work practices and personal protective equipment (PPE) to ensure safety of self and other workers
  - 5.2 Minimise the generation of wastes
  - 5.3 Ensure the safe disposal of wastes
  - 5.4 Clean, care for and maintain work area, equipment and tools
  - 5.5 Report any hazards or incidents according to workplace procedures
- 6 **Maintain records**
  - 6.1 Record data in accordance with workplace requirements
  - 6.2 Maintain glass apparatus and system equipment logs in accordance with workplace requirements
  - 6.3 Maintain security and confidentiality of workplace information

## **Foundation Skills**

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

## Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

### **Standards, codes, procedures and/or workplace requirements**

Standards, codes, procedures and/or workplace requirements include the latest version of one or more of:

- Australian and international standards covering the requirements for the laboratory safety; quality and environmental management; and labelling, storage, handling and transport of hazardous materials
- national work health and (WHS) standards and codes of practice
- specific codes, guidelines and procedures, such as principles of good laboratory practice (GLP)
- workplace documents, such as standard operating procedures (SOPs); quality and equipment manuals; maintenance schedules; material safety data sheets (MSDS); safety procedures; material, production and product specifications; production and laboratory schedules; workplace recording and reporting procedures; and waste minimisation and safe disposal procedures

### **Hazards**

Hazards include, but are not limited to, one or more of:

- glass dust
- sharps and broken glassware
- residues on used glassware, such as mercury
- heat sources, such as burners and ovens
- fluids under pressure (acetylene and oxygen)
- cuts associated with glass grinders and cutters
- manual handling of heavy bags, containers and equipment

### **Safety procedures**

Safety procedures include, but are not limited to, one or more of:

- ensuring access to service shut-off points
- recognising and observing hazard warnings and safety signs
- correct labelling of samples and hazardous materials
- extracting dust
- following established manual handling procedures
- handling and storing hazardous materials and equipment in accordance with labels, MSDS, manufacturer instructions, and workplace procedures and regulations
- regular cleaning and/or decontamination of equipment and work areas

- using PPE, such as heat resistant gloves, safety glasses, goggles, face guards, coveralls, respirators and safety boots

### **WHS and environmental management requirements**

WHS and environmental management requirements include:

- complying with WHS and environmental management requirements at all times, which may be imposed through state/territory or federal legislation. These requirements must not be compromised at any time
- applying standard precautions relating to the potentially hazardous nature of samples
- accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and State and Territory Departments of Health, where relevant

## **Unit Mapping Information**

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## **Links**

MSA Training Package Implementation Guides - <http://mskills.org.au/training-packages/info/>