



Australian Government

MSL965002 Perform glass coating, grinding and finishing operations

Release: 1

MSL965002 Perform glass coating, grinding and finishing operations

Modification History

Release 1. Supersedes and is equivalent to MSL965002A Perform glass coating, grinding and finishing operations

Application

This unit of competency covers the ability to perform glass coating, grinding and finishing operations for scientific glassware.

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.

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| 1 | Prepare for work | 1.1 | Identify appropriate specifications and procedures, and discuss any issues or problems with customer and work team |
| | | 1.2 | Identify hazards and workplace safety requirements |

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| | | 1.3 | Record description of the job, compare with specification and plan work activities |
| | | 1.4 | Prepare equipment in accordance with job requirements |
| 2 | Perform glass coating operations | 2.1 | Identify, select and prepare appropriate grades of glass, coating materials, abrasives, solutions and finishing agents as appropriate for the job |
| | | 2.2 | Clean and prepare glass as required for coating operation |
| | | 2.3 | Perform glass coating operation according to standard procedure |
| | | 2.4 | Perform post-coating procedures to maintain coated surface |
| | | 2.5 | Perform coating removal processes |
| | | 2.6 | Ensure appropriate disposal of all waste |
| 3 | Perform glass grinding operations | 3.1 | Identify and prepare grinding tools as required for procedure |
| | | 3.2 | Select appropriate abrasives for grinding operations |
| | | 3.3 | Perform grinding and repairing/re-grinding processes as appropriate |
| | | 3.4 | Test ground surfaces to ensure they meet compliance requirements |
| | | 3.5 | Identify and rectify problems that arise during operations |
| 4 | Perform glass finishing operations | 4.1 | Establish finishing requirements for the job |
| | | 4.2 | Perform finishing procedures as required for job |
| 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 |

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| | 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 | Ensure 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 safety (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

Release 1. Supersedes and is equivalent to MSL965002A Perform glass coating, grinding and finishing operations

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=5c63a03b-4a6b-4ae5-9560-1e3c5f462baa>

Assessment Requirements for MSL965002 Perform glass coating, grinding and finishing operations

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Performance Evidence

Evidence of competence in this unit must satisfy all of the requirements of the elements and performance criteria, and include demonstration of:

- safely performing glass coating operations, including:
 - cleaning and preparation of glass surfaces
 - preparing coating solutions
 - coating/strip coating and dedicated coating
 - protecting coated surfaces
 - electroplating
 - removal/partial removal of coating
 - metal coating glass surfaces or applying opaque treatments to industry standards
- safely performing glass grinding operations, including:
 - grinding and hand lapping glass to be used in fabrication and for a precision fit
 - selecting abrasives and metal grinding tools
 - interpreting specifications for glass-ground joints
 - testing ground surfaces for leakage
 - preparing glass stopcocks
- safely performing glass finishing operations, including:
 - cleaning, rinsing and drying
 - evacuating and sealing
 - metallising
 - flame and/or mechanical polishing
- following safe work practices and recommended procedures for glass coating, grinding and finishing operations
- selecting appropriate grades of glass, coating materials, abrasives and finishing agents for specific jobs
- identifying atypical situations or problems and taking appropriate actions
- minimising waste
- communicating with customers/research team to confirm specifications and timelines and to seek advice or additional information when necessary
- recording and reporting work results.

Knowledge Evidence

Must provide evidence that demonstrates knowledge of:

- use of glassblowing materials, equipment, tools and techniques
- chemistry of coating materials and coating process
- theoretical and practical principles of materials and processes for glass coating, glass grinding and glass finishing
- theory of equipment operation and use
- common faults in coating, grinding and finishing operations and methods for control
- safety procedures relevant to coating, grinding and finishing operations
- waste disposal procedures
- relevant hazards, work health and safety (WHS) and environment requirements.

Assessment Conditions

- Judgement of competence must be based on holistic assessment of the evidence. Assessment methods must confirm consistency of performance over time, rather than a single assessment event. The timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions.
- This unit of competency is to be assessed in the workplace or a simulated workplace environment. A simulated workplace environment must reflect realistic operational workplace conditions that cover all aspects of workplace performance, including the environment, task skills, task management skills, contingency management skills and job role environment skills.
- Foundation skills are integral to competent performance of the unit and should not be assessed separately.
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.
- Knowledge evidence may be collected concurrently with performance evidence or through an independent process, such as workbooks, written assessments or interviews (provided a record is kept in each case).
- This unit of competency may be assessed with:
 - MSL965001 Design and manufacture glass apparatus and glass systems
 - MSL965003 Construct, modify and maintain vacuum systems
- Holistic assessment methods include:
 - inspection of examples of glasswork coating, grinding and finishing and workplace documentation completed by the candidate
 - analysis of the candidate's work records over a period of time to ensure accurate and consistent work is obtained within required timelines
 - feedback from peers and supervisors
 - oral/written questioning about properties of glass; glass coating, grinding and finishing operations; quality problems and safe work procedures.
- Access is required to instruments, equipment, materials, workplace documentation, procedures and specifications associated with this unit, including, but not limited to:

- a scientific glassblowing facility; appropriate safety equipment; materials; safe work procedures; and coating, grinding and finishing methods
- bench burner, hand torch, micro torch and ribbon burner, gas supplies and gas economiser
- coating solutions and baths
- grinding tools and abrasives
- 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
- glassworking lathe, mechanical glass cutters and saws, mechanical glass grinding equipment
- annealing oven
- measuring and recording equipment.
- Assessors must satisfy the assessor competency requirements that are in place at the time of the assessment as set by the VET regulator.
- The assessor must demonstrate both technical competence and currency.
- Technical competence can be demonstrated through:
 - relevant VET or other qualification/Statement of Attainment AND/OR
 - relevant workplace experience.
- Currency can be demonstrated through:
 - performing the competency being assessed as part of current employment OR
 - having consulted with a laboratory about performing the competency being assessed within the last twelve months.

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