



Australian Government

MSL974029 Operate an automated mineral analysis system

Release: 1

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Modification History

Release	Comments
Release 1	New unit released in <i>MSL Laboratory Operations Training Package Release 2.0</i>. Supersedes and equivalent to MSL974015 Operate an automated mineral analysis system. Foundation skill information added. Range of conditions removed. Assessment requirements amended. Equivalent outcome.

Application

This unit of competency describes the skills and knowledge to operate a computer-controlled robotic system for the specialised analysis of minerals, such as iron ore. Automated mineral analysis systems are operated in conjunction with robotic sample preparation systems to handle high volumes of relatively homogeneous material or when there is a need to minimise the operator's contact with potentially hazardous materials.

This unit applies to instrument operators in the mining industry sector. Personnel are required to adjust the system's operating parameters to suit individual sample batches and to achieve production targets without sacrificing quality or safety standards. They are required to interpret routine system error codes and apply specified corrective actions and seek advice when non-routine problems arise. Operators are not required to interpret analytical methods or results.

No licensing or certification requirements exist at the time of publication. However, regulations and/or external accreditation requirements for laboratory operations exist, so local requirements should be checked. Relevant legislation, industry standards and codes of practice within Australia must also be applied.

Pre-requisite Unit

Nil

Competency Field

Testing

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 automated analysis system for operation	1.1	Confirm equipment status, shift priorities, work flow issues and/or specific client requirements with supervisor and other operators
		1.2	Plan or adjust work flow to suit maintenance or servicing as required
		1.3	Review job requests to identify samples/batches, required operating parameters and any special instructions/analyses for each
		1.4	Identify hazards, safety equipment and safe work procedures associated with samples, reagents, analytical methods and operating robotic arms
		1.5	Perform routine system checks at start of shift
2	Conduct or monitor loading of samples into system	2.1	For systems with a manual in-feed station, prepare vials with the specified sample volume and load them in the correct sequence
		2.2	For fully automated systems, monitor sample in-feed station to ensure vials contain specified minimum volumes
3	Monitor and adjust system operation	3.1	Adjust system operating parameters, such as furnace temperature, to suit specific batch requirements
		3.2	Monitor control screens continuously and respond promptly to error codes
		3.3	Conduct regular visual checks to ensure that system elements are operating correctly
		3.4	Interpret routine error codes to identify faulty system elements
		3.5	Take control of system and activate interlocks to isolate relevant system elements before investigating faults
		3.6	Clean and reposition robots, vials, crucibles or other system elements as necessary

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

- 3.7 Use appropriate system checks and commands to reset system elements, re-enter sample data and resume operations
- 3.8 Seek advice about dealing with any situation beyond scope of responsibility or knowledge
- 3.9 Liaise with and assist relevant service personnel to ensure major breakdowns are rectified promptly

4 **Maintain a safe work environment**

- 4.1 Use safe work practices, safety equipment and personal protective equipment (PPE) to ensure personal safety and that of others
- 4.2 Clean and maintain system elements, maintain consumable stocks, and care for and store equipment as required
- 4.3 Minimise the generation of waste and environmental impacts
- 4.4 Segregate and dispose of wastes in accordance with workplace requirements

Foundation Skills

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

- Problem solving skills to recognise potential issues caused by prior sample handling and/or preparation and rectify.

Other foundation skills essential to performance are explicit in the performance criteria of this unit.

Unit Mapping Information

Equivalent to MSL974015 Operate an automated mineral analysis system, Release 1.

Links

MSL Laboratory Operations Companion Volume Implementation Guide is available from VETNet -

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

Assessment Requirements for MSL974029 Operate an automated mineral analysis system

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Performance Evidence

There must be evidence the candidate has completed the tasks outlined in the elements and performance criteria of this unit, and:

- operated an automated mineral analysis system safely, reliably and efficiently for at least 3 different sets of operating conditions or 3 different types of samples.

Knowledge Evidence

There must be evidence the candidate has knowledge of:

- importance of good customer relations, achieving production targets and minimising costs and rework
- purpose of analytical tests conducted in job role
- function and operation of automated system elements and flow chart for automated analysis process
- common mineral samples:
 - pulverised solids, such as rocks, minerals, soils, sands and stream sediments
 - pulverised core and other drill samples
- automated analytical methods:
 - thermal gravimetric analysis (TGA)
 - x-ray fluorescence (XRF)
- workplace procedures for:
 - specific samples, batches and clients (such as labelling, preparation, analysis, storage, transport and disposal)
 - computer operation, including use of specific control screens, menus and control commands
 - common faults, routine system error codes and specified corrective actions for each

- cleaning/maintaining equipment and instruments used in job role
- preventing contamination of samples and equipment
- ensuring traceability of samples
- automated system elements:
 - sample in-feed station
 - weigh stations
 - mould table
 - furnaces
 - robotic arms
 - conveyor belts
 - acid/ultrasound baths for cleaning crucibles
 - compressed air system
- routine system checks
- visual checks:
 - presence of surface dust on system elements, particularly sensors
 - sample contamination during sample extraction from vials
 - cleanliness of crucibles before re-use
- typical routine system faults and corrective actions
- workplace and/or legal traceability requirements
- awareness of environmental sustainability issues as they relate to the work task
- legal, ethical and work health and safety (WHS) requirements specific to the work task.

Assessment Conditions

Skills must have been demonstrated in the workplace or in a simulated environment that reflects workplace conditions and contingencies. The following conditions must be met for this unit:

- use of suitable facilities, equipment and resources, including:
 - an automated mineral analysis system, operating procedures, reagents, sample containers and labels
 - mineral ore samples, such as iron ore
 - client requests/documentation, such as client profile, sample identification and sample receipts, required analyses, storage and/or disposal, and service charges
 - safe work procedures, safety equipment and PPE.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

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