



Australian Government

MSL974005 Perform physical tests

Release: 1

MSL974005 Perform physical tests

Modification History

Release 1. Supersedes and is equivalent to MSL974005A Perform physical tests

Application

This unit of competency covers the ability to interpret physical test requirements, prepare samples, conduct pre-use and calibration checks on equipment and perform routine physical tests. These tests will involve several measurement steps. The unit includes data processing and interpretation of results and tracking of obvious test malfunctions where the procedure is standardised. However, personnel are not required to analyse data, optimise tests or procedures for specific samples or troubleshoot equipment problems where the solution is not apparent.

This unit of competency is applicable to laboratory or technical assistants and instrument operators working in the manufacturing, environment, food and construction materials testing industry sectors.

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

Nil

Competency Field

Testing

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

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

1	Interpret and schedule test requirements
---	---

- | | |
|-----|--|
| 1.1 | Review test request to identify samples to be tested, test method and equipment/instruments involved |
| 1.2 | Identify hazards and workplace control measures associated with the sample, preparation/test methods and |

		equipment
		1.3 Plan work sequences to optimise throughput of multiple samples
2	Receive and prepare samples	2.1 Log samples using standard operating procedures (SOPs)
		2.2 Record sample description, compare with specification and note and report discrepancies
		2.3 Prepare samples and standards in accordance with physical testing requirements
		2.4 Ensure traceability of samples from receipt to reporting of results
3	Check equipment before use	3.1 Set up equipment/instruments in accordance with test method requirements
		3.2 Perform pre-use and safety checks in accordance with relevant workplace and operating procedures
		3.3 Identify faulty or unsafe components and equipment and report to appropriate personnel
		3.4 Check equipment calibration using specified procedures
		3.5 Quarantine out-of-calibration equipment/instruments
4	Test samples to determine physical properties	4.1 Operate equipment/instruments in accordance with test method requirements
		4.2 Perform tests/procedures on all samples and standards in accordance with specified methods
		4.3 Shut down equipment/instruments in accordance with operating procedures
5	Process and interpret data	5.1 Record test data noting atypical observations
		5.2 Ensure calculated values are consistent with

		expectations
	5.3	Estimate and document uncertainty of measurement in accordance with workplace procedures
	5.4	Record and report results in accordance with workplace procedures
	5.5	Interpret trends in data and/or results and report out-of-specification or atypical results promptly to appropriate personnel
	5.6	Determine if obvious procedure or equipment problems have led to atypical data or results
6	Maintain a safe work environment	6.1 Use established safe work practices and personal protective equipment (PPE) to ensure personal safety and that of other laboratory personnel
		6.2 Minimise the generation of wastes and environmental impacts
		6.3 Ensure the safe collection of laboratory and hazardous waste for subsequent disposal
		6.4 Care for and store equipment and materials as required
7	Maintain laboratory records	7.1 Enter approved data into laboratory information management system (LIMS)
		7.2 Maintain confidentiality and security of workplace information and laboratory data
		7.3 Maintain equipment and calibration logs in accordance with workplace procedures

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 competence of testing and calibration laboratories, laboratory safety and quality management
- national work health and safety (WHS) standards and codes of practice, and national measurement regulations and guidelines
- standard methods for physical tests
- specific codes, guidelines, procedures and methods, such as the Australian code of good manufacturing practice for medicinal products (GMP), and principles of good laboratory practice (GLP)
- workplace documents, such as SOPs; quality and equipment manuals; calibration and maintenance schedules; material safety data sheets (MSDS) and safety procedures; material, production and product specifications; production and laboratory schedules; workplace recording and reporting procedures; and waste minimisation and safe disposal procedures

Preparation of samples

Preparation of samples includes one or more of:

- drying, washing, grinding, sieving, melting and moisture conditioning
- cutting, trimming or machining of test specimens, and etching

Physical tests and procedures

Physical tests and procedures include one or more of:

- precise measurement of position, orientation and dimensions, such as:
 - 3-D set-up of manufacturing tools using inclinometers, verniers and laser
- thickness using vernier, X-ray and gamma ray
- particle size using sieving and laser
- dimensional stability involving expansion, contraction and weathering
- movement using strain gauge and accelerometer
- mass, density and specific gravity and related tests, such as:
 - moisture/density relationship, loose and compacted density
 - reactivity to moisture, Atterberg limits, and shrink/swell index

- thermal tests, such as:
 - thermal conductivity and coefficients of expansion (e.g. linear and volume)
 - calorimetry, (e.g. specific heat and latent heat), and combustion properties (e.g. enthalpy and energy content)
 - viscosity and melt flow index
 - drying times
 - thermal stability of products
- optical tests, such as:
 - flatness and surface finish
 - refractive index and optical rotation
 - transmission/absorption of filters and colour matching of products
- acoustic measurements, such as:
 - amplitude and frequency, absorption, reflection and transmission, intensity, attenuation and loudness (dB)
- electrical tests, such as:
 - conductance, resistance and insulation, and temperature dependence of dielectrics
- magnetic tests, such as:
 - permeability, retentivity, hysteresis loss and coercivity, and intrinsic induction

Tests

Tests include methods for one or more of:

- control of starting materials, in-process materials and finished products
- investigation of sources of construction materials
- basic troubleshooting of workplace processes

Safe work practices Safe work practices 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
- labelling of samples and hazardous materials
- handling and storage for hazardous materials and equipment in accordance with labelling, MSDS and manufacturer instructions
- identifying and reporting operating problems or equipment malfunctions
- cleaning equipment and work areas regularly using workplace procedures
- using PPE, such as hard hats, hearing protection, gloves, safety

glasses, coveralls and safety boots

- following established manual handling procedures
- reporting abnormal emissions, discharges and airborne contaminants, such as noise, light, solids, liquids, water/waste water, gases, smoke, vapour, fumes, odour and particulates, to appropriate personnel

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 MSL974005A Perform physical tests

Links

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