



Australian Government

Assessment Requirements for MSL975016

Perform complex tests to measure engineering properties of materials

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to MSL975016A Perform complex tests to measure engineering properties of materials

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 preparing at least three (3) different test specimens and performing complex, multi-stage mechanical tests on them
- accurately interpreting client requests, complex tests and sample preparation methods, and safety information
- planning work sequences involving multiple/parallel tasks
- selecting test methods, operating parameters and test ranges to suit the material and its intended use
- creating test conditions that suit the material's intended use
- preparing and orientating test pieces precisely
- safely setting up, checking and using, cleaning and maintaining equipment in accordance with workplace procedures
- optimising measurement procedures and recognising critical measurement points during the tests
- maintaining close attention to measurement procedures, accuracy and precision during lengthy complex tests
- calculating and determining required engineering properties with appropriate accuracy, precision and units (e.g. total and effective stress, strain and pressure)
- using calibration charts
- recording and reporting data and results accurately and legibly in accordance with workplace procedures
- interpreting significant features of data and graphs and making logical conclusions
- recognising atypical data, errors and unexpected results and tracing artefacts and troubleshooting problems with procedures or equipment
- maintaining security, integrity and traceability of all samples, test pieces and documentation
- seeking timely advice from a supervisor
- communicating with clients or outside service technician in accordance with workplace procedures
- minimising environmental impacts, including safe collection, storage and appropriate disposal of waste.

Knowledge Evidence

Must provide evidence that demonstrates knowledge of:

- details of complex, multi-stage mechanical test methods routinely used in job role, including:
 - purpose and principles of test
 - relationship between the engineering properties and uses of construction materials
 - key sample preparation stages
 - key treatment and measurement stages
 - calculation steps to give results in appropriate units and precision
 - expected values for sample type
 - sources of uncertainty and methods for their control
- principles and concepts underpinning test methods, such as:
 - stress, strain, pressure, total and effective stress, fatigue, creep, failure modes of materials, strength/consolidation of materials and permeability
 - electrical safety concepts, including voltage, current, resistance, conductors/insulators and AC/DC
- principles and concepts related to equipment/instrument operation and testing, including the function of key components and effects on test of modifying variables
- pre-use checks and operating procedures for test equipment/instruments routinely used in job role
- basic equipment and method troubleshooting procedures
- workplace and legal traceability requirements for samples, test pieces, test data and results
- procedures for recording and reporting test results, calculations, test observations and unexpected or atypical results and equipment problems
- confidentiality requirements
- hazards associated with construction material testing, relevant work health and safety (WHS) and environmental management requirements.

Assessment Conditions

- Judgment 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.
- 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:
 - MSL925001 Analyse data and report results
- Holistic assessment methods include:
 - review of test data, results, records and workplace documentation generated by the candidate
 - feedback from supervisors and clients regarding the candidate's ability to conduct a range of complex, multi-stage mechanical tests reliably, safely and efficiently
 - observation of candidate conducting a range of complex tests on engineering materials
 - oral or written questioning about workplace procedures and complex, multi-stage mechanical test methods relevant to job role.
- Access is required to instruments, equipment, materials, workplace documentation, procedures and specifications associated with this unit, including, but not limited to:
 - an engineering materials testing laboratory with appropriate test equipment, instruments and samples as specified in the test methods
 - test methods and description of test set-up, data sets and technical/administrative records, and workplace procedures
 - calculator and/or computer and relevant software or laboratory information management system (LIMS).
- 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.

Links

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