



Australian Government

Department of Education, Employment and Workplace Relations

PMLTEST307B Prepare trial batches for evaluation

Release: 1

PMLTEST307B Prepare trial batches for evaluation

Modification History

Unit Descriptor

This unit of competence covers the ability to prepare trial batches of materials for evaluation. Materials can include soil, minerals and manufactured products, such as concrete, asphalt, food, plastics, paint and other industrial chemicals.

This unit of competency has no prerequisites.

This unit of competency is applicable to laboratory assistants working in all industry sectors. Industry representatives have provided case studies to illustrate the practical application of this unit of competency and to show its relevance in a workplace setting. These are found at the end of this unit of competency under the section This competency in practice.

Application of the Unit

Licensing/Regulatory Information

Pre-Requisites

Employability Skills Information

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

Performance Criteria describe the level of performance required to demonstrate achievement of the element.

Elements and Performance Criteria

Elements and Performance Criteria

Element

Performance Criteria

- | | |
|----------------------------------|--|
| 1 Prepare for trial batch mixing | 1.1 Identify the job, materials, appropriate procedures and safety requirements |
| | 1.2 Record description of the job to be undertaken, compare with specification and report any variations |
| | 1.3 Select and prepare tools, equipment and materials |

- in accordance with job requirements
- 1.4 Confirm the properties and quantities of materials to be used
 - 1.5 Confirm that the required materials are available and ready for use
- 2 Mix trial batch for evaluation
- 2.1 Measure out quantities of materials ready for mixing
 - 2.2 Mix the materials according to established procedures
 - 2.3 Discharge the mixture ready for inspection and testing according to established procedures
 - 2.4 Record details of the mix and any observations according to established procedures
- 3 Evaluate properties of the mixture by inspection and standard test methods
- 3.1 Obtain representative samples of the mix for testing
 - 3.2 Perform specified tests according to established procedures
 - 3.3 Handle and transport samples in accordance with established procedures
 - 3.4 Label samples and record details in accordance with established procedures
- 4 Clean equipment and dispose of materials
- 4.1 Clean mixing, measuring, sampling and testing equipment after use
 - 4.2 Return unused materials to storage
 - 4.3 Dispose of excess materials safely and ethically
- 5 Maintain records
- 5.1 Record data in accordance with established procedures
 - 5.2 Maintain equipment records in accordance with established procedures
 - 5.3 Maintain confidentiality of enterprise information

- 6 Maintain a safe work environment
 - 6.1 Use established safe work practices and personal protective equipment to ensure personal safety and that of other laboratory personnel
 - 6.2 Minimise the generation of wastes and environmental impacts
 - 6.3 Ensure safe disposal of laboratory and hazardous wastes
 - 6.4 Clean, care for and store equipment and reagents as required.

Required Skills and Knowledge

Evidence Guide

The Evidence Guide describes the underpinning knowledge and skills that must be demonstrated to prove competence.

Critical aspects of competency

Competency must be demonstrated in the ability to perform consistently at the required standard. In particular, assessors should look to see that the candidate:

calculates batch quantities, concentrations and other relevant parameters

follows standard operating procedures

measures quantities accurately

takes representative samples

identifies and describes materials accurately

handles and transports samples correctly

records sampling and testing information

uses tools and equipment effectively and efficiently

observes, interprets and reports atypical situations

communicates problems to appropriate personnel

records and communicates work results

works safely

interprets information from materials safety data sheets.

Underpinning knowledge

Competency includes the ability to apply and explain:

the properties of mixing materials and how they affect the properties of the final product

hazards involved with materials and equipment involved

measurement of mass and volume

basic calculations involving SI units, proportion, ratio, and percentage

representative sampling

uses of various materials/enterprise products

basic testing methods for relevant materials

enterprise traceability requirements

relevant health, safety and environment requirements.

Assessment context and methods

This unit of competency is to be assessed in the workplace or simulated workplace environment.

The following assessment methods are suggested:

analysis of trial batches prepared by the candidate over a period of time to ensure accurate and consistent work is obtained within required timelines

inspection of workplace documentation completed by the candidate

feedback from peers and supervisors

use of suitable simulation and/or a range of case studies/scenarios.

In all cases, practical assessment should be supported by questions to assess underpinning knowledge and those aspects of competency which are difficult to assess directly. Questioning techniques should suit the language and literacy levels of the candidate.

Interdependent assessment of unit

This unit of competency may be assessed with:

PMLSAMP302A Handle and transport samples or equipment

PMLSAMP400B Prepare representative samples in accordance with a sampling plan
PMLTEST300B Perform basic tests.

Resource implications

Resources may include:

standard facility with appropriate tools, equipment and materials
 enterprise procedures, MSDS, product formulation/specifications.

This competency in practice

Construction materials

A laboratory assistant works for a concrete manufacturer. A client requires concrete for a specific project that cannot be supplied using existing standard mixes. The manufacturer must use special aggregates and cement to meet the durability and strength specifications for the project. The laboratory manager obtains quantities of the materials for evaluation purposes. The assistant tests the aggregates to determine their grading properties. From these results, he/she designs a mix to satisfy the project specifications using a standard design method. The mix requires the use of pozzolanic materials and admixtures that were obtained from the suppliers.

The manager provides the assistant with the batch quantities required to produce one cubic metre of concrete. To test the mix design, the assistant will produce a 20-litre batch in the laboratory. She/he calculates that this quantity will provide sufficient material for the required tests, without undue waste. She/he calculates the quantity of each material required for the trial batch. The assistant selects and prepares the tools and equipment she/he needs to mix, sample and test the concrete. She/he wears overalls, safety boots and glasses, and uses a barrier cream. She/he measures out the quantities required for the trial batch, charges the mixer and allows it to mix for the specified time. She/he then discharges the concrete onto a suitable surface. She/he checks its slump, cohesiveness and air content, recording the data on standard enterprise forms. The manager inspects the concrete, and decides that it is over-sanded and has excessive slump. She/he adjusts the batch quantities and draws up amended values. She/he disposes of the excess concrete and cleans the equipment and tools. She/he then mixes a new batch using the amended figures. This process continues until the manager is satisfied with the concrete quality. She/he then mixes a larger batch so that she/he can prepare specimens for testing its hardened-state properties.

Key Competencies

The seven key competencies represent generic skills considered for effective work participation. The bracketed numbering against each of the key competencies indicates the performance level required in this unit. These are stand-alone levels and do not correspond to the Australian Qualifications Framework (AQF).

Level (1) represents the competence to undertake tasks effectively

Level (2) represents the competence to manage tasks

Level (3) represents the competence to use concepts for evaluating and reshaping tasks.

Collecting, analysing and organising information	Communicating ideas and information	Planning and organising activities	Working with others and in teams	Using mathematical ideas and techniques	Solving problems	Using technology
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Level 1	Level 1	Level 1	Level 1	Level 1	Level 1	Level 1
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Range Statement

The range of variables relates to the unit of competency as a whole. It allows for different work environments and situations that will affect performance.

Where reference is made to industry Codes of Practice, and/or Australian/international standards, it is expected the latest version will be used.

This unit of competence describes work conducted by laboratory assistants, generally working under the guidance of a senior technician, scientific officer, laboratory supervisor/manager. Operations are performed in accordance with laboratory and/or enterprise procedures, and appropriate legislative requirements. These procedures and requirements can include or be prepared from:

- industry Codes of Practice
- environmental legislation and regulations
- standard operating procedures (SOPs)
- equipment manuals
- equipment start-up, operation and shutdown procedures
- calibration and maintenance schedules
- quality manuals
- enterprise recording and reporting procedures
- production and laboratory schedules
- material, production and product specifications.

Materials, tools and equipment used may include:

- soils, concrete, asphalt, aggregates, polymers, ceramics, metals, foodstuffs, solvents
- ovens, sieves, balances, volumetric measures, mixers
- hand tools, including shovels, scoops, spatulas
- consumables, including sample bags, labels
- documentation, including specifications, manufacturers' handbooks, worksheets
- test equipment appropriate to the various materials.

Typical skills may include:

- working safely with equipment and hazardous materials
- working safely in laboratory conditions
- setting up and maintaining tools and equipment
- using tools and equipment to perform basic sampling techniques
- using tools and equipment to perform basic testing techniques
- basic calculations
- observing and recording information on testing and sampling
- making basic measurements of volume and mass
- handling and storing materials appropriately.

Typical problems may include:

- not following standard operating procedures
- measurement errors
- calculation errors
- materials of unreliable quality
- insufficient mixing
- poor sampling procedures
- equipment breakdown and breakage.

Hazards may include:

- electric shock

biohazards, such as microbiological organisms and agents associated with soil, air, water
solar radiation, dust, noise

chemicals

sharps, broken glassware and hand tools

flammable liquids and gases

fluids under pressure

manual handling heavy objects

crushing, entanglement, cuts associated with moving machinery or falling objects.

Safety procedures may include:

recognising hazard warnings and safety signs

use of personal protective equipment, such as hard hats, hearing protection, sunscreen lotion,
gloves, safety glasses, goggles, face guards, coveralls, safety boots

use of material safety data sheets (MSDS)

following established manual handling procedures

regular cleaning and/or decontaminating of equipment and work areas

ensuring access to service shut off points

identifying and reporting operating problems or equipment malfunctions.

Health, safety and environment

All operations to which this unit applies are subject to stringent health, safety and environmental (HSE) requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

All operations assume the potentially hazardous nature of samples and require standard precautions to be applied. Users should access and apply current industry understanding of infection control issued by the National Health and Medical Research Council and State and Territory Departments of Health. All operations are performed in accordance with standard operating procedures.

Unit Sector(s)