

**Specification of Competency Standards**  
**for the Testing, Inspection and Certification Industry**  
**Unit of Competency**

Functional Area - Testing Operations

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|------------|--|
| Title      | Perform chemical tests on construction materials   |
| Code       | 105788L4   |
| Range      | This unit of competency (UoC) covers the abilities to carry out chemical tests on construction materials independently by applying knowledge of analytical chemistry, record accurate test data and conclude test results in testing laboratories.   |
| Level      | 4  |
| Credit     | 4 (For Reference Only)   |
| Competency | <p>Performance Requirements</p> <p>1.Possess knowledge of analytical chemistry and properties of construction materials</p> <ul style="list-style-type: none"> <li>• Apply the principles and concepts underpinning chemical analysis for construction materials.</li> <li>• Identify construction materials and corresponding test methods routinely used in testing laboratories including: <ul style="list-style-type: none"> <li>○ purpose and principles of test,</li> <li>○ properties of construction materials under test,</li> <li>○ key preparation/measurement steps in test method,</li> <li>○ calculation steps to give results in appropriate accuracy, precision, units and uncertainty,</li> <li>○ expected values for sample type.</li> </ul> </li> <li>• Describe the operation of equipment and apparatus used for chemical analysis of selected construction materials, e.g.: <ul style="list-style-type: none"> <li>○ concrete and its constituent materials,</li> <li>○ soil and rock,</li> <li>○ asphalt and bituminous materials,</li> <li>○ aggregates.</li> </ul> </li> <li>• Describe the procedures for ensuring traceability of samples, test pieces, test data and results.</li> <li>• Describe the procedures for equipment calibration and performance check.</li> </ul> <p>2.Perform chemical tests on construction materials</p> <ul style="list-style-type: none"> <li>• Determine the test request and identify sample characteristics that may affect selection and application of test methods and conditions.</li> <li>• Apply appropriate test method and conditions in compliance with test requirements on selected type of construction materials.</li> <li>• Prepare a representative analytical portion of the laboratory sample to reduce the sample complexity and eliminate matrix effects.</li> <li>• Carry out routine performance check of equipment/instrument according to manufacturer’s instruction and/or relevant standard to ensure it is ready for chemical tests on construction materials.</li> <li>• Set up and check the calibration status of laboratory equipment and apparatus for measurements to suit sample/test requirements.</li> <li>• Carry out appropriate chemical tests on selected construction material independently by measuring analyte response for calibration standards, validation and quality control checks, and samples according to requirements of test method.</li> <li>• Conduct sufficient measurements to obtain accurate and reliable data and/or observations.</li> </ul> <p>3.Exhibit professionalism</p> |

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|---------------------|---|
|                     | <ul style="list-style-type: none"><li>• Troubleshoot analytical procedures or equipment in case of any atypical observations/data/results being identified during sample analysis or performance check.</li><li>• Ensure integrity and confidentiality of laboratory data and information by observing the code of conduct of the laboratory.</li></ul>   |
| Assessment Criteria | <p>The integrated outcome requirements of this UoC are the abilities to:</p> <ul style="list-style-type: none"><li>• carry out chemical tests on selected construction material independently by applying appropriate testing equipment and test conditions according to the requirements of relevant test method,</li><li>• record accurate test data and observations and conclude test results to confirm the compliance of the construction material.</li></ul> |
| Remark              | <p>Practitioners are required to have prior knowledge of the following UoCs:</p> <ul style="list-style-type: none"><li>• Perform basic chemical tests and</li></ul>   |