

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

Functional Area - Testing Operations

Title	Perform physical and mechanical tests on concrete and its constituent materials
Code	105837L3
Range	This unit of competency (UoC) covers the abilities to carry out physical and mechanical tests on selected hardened concrete and its constituent materials such as aggregate, cement, water, admixture, PFA, GGBS, silica fume and other additives, and record test data in testing laboratories.
Level	3
Credit	6 (For Reference Only)
Competency	<p>Performance Requirements</p> <p>1. Possess knowledge of physical and mechanical tests applicable to concrete and its constituent materials</p> <ul style="list-style-type: none"> <li>• Describe the principles of test methods for determining physical and mechanical properties of concrete and its constituent materials.</li> <li>• Identify the specification requirements of testing concrete and its selected constituent materials.</li> <li>• Identify sampling requirements in test methods, e.g. selection of samples, minimum sample size / mass.</li> <li>• Identify the testing and environmental conditions under specified requirements of testing concrete and its constituent materials, e.g. laboratory temperature and relative humidity.</li> <li>• Describe the principles and operation of equipment used for physical and mechanical tests on concrete and its constituent materials.</li> <li>• Specify the calibration requirement of equipment.</li> </ul> <p>2. Perform physical and mechanical tests on concrete and its constituent materials</p> <ul style="list-style-type: none"> <li>• Apply appropriate test methods/standards and testing equipment for physical and mechanical tests on selected concrete and its constituent materials.</li> <li>• Carry out appropriate tests on selected concrete or its constituent material sample according to the requirements of relevant test methods/standards, e.g.: <ul style="list-style-type: none"> <li>○ density, strength, modulus, permeability of hardened concrete,</li> <li>○ particle size and shape, density, accelerated mortar bar test, foreign materials content, crushing and impact test of aggregate,</li> <li>○ suitability of water for mixing concrete,</li> <li>○ fineness, density, setting time, soundness, moisture content, flexural and compressive strength of cementitious materials or additives, e.g. PFA, GGBS, silica fume and admixture,</li> <li>○ density, fineness, setting times, soundness, standard consistence, flexural and compressive strength of cement.</li> </ul> </li> <li>• Maintain testing and environmental conditions under specified requirements of the test.</li> <li>• Carry out required calibration checks on testing equipment.</li> <li>• Record test data for reporting.</li> </ul> <p>3. Exhibit professionalism</p> <ul style="list-style-type: none"> <li>• Ensure integrity and confidentiality of test data by observing the code of conduct of the laboratory.</li> <li>• Follow established safe work practices and use personal protective equipment to ensure personal safety and that of other laboratory personnel, e.g. proper practices of lifting/handling concrete cube sample.</li> </ul>

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Assessment Criteria	The integrated outcome requirements of this UoC are the abilities to: <ul style="list-style-type: none"><li>• carry out physical and mechanical tests on selected concrete or its constituent material by applying appropriate testing equipment according to the requirements of test methods/standards and test specifications,</li><li>• record accurate test data by verifying equipment calibration status.</li></ul>
Remark	