

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

Functional Area - Testing Operations

Title	Apply chromatographic techniques to chemical testing
Code	105784L4
Range	This unit of competency (UoC) covers the abilities to optimise and operate chromatographic instruments independently, record and analyse test data accurately for chemical analysis by applying the principles of chromatography in testing laboratories.
Level	4
Credit	6 (For Reference Only)
Competency	<p>Performance Requirements</p> <p>1. Possess knowledge of chromatographic techniques</p> <ul style="list-style-type: none"> <li>• Apply the principles of chromatographic separation, chromatography concepts and calculations.</li> <li>• Describe the construction and operation of the following chromatographic instruments: <ul style="list-style-type: none"> <li>○ gas chromatograph (GC) including headspace sample preparation technique,</li> <li>○ liquid chromatograph (LC),</li> <li>○ ion chromatograph (IC).</li> </ul> </li> <li>• Describe the operation, construction, selectivity, sensitivity, linear range and typical applications of chromatographic systems including injectors, columns and commonly used detectors except mass selective detector.</li> <li>• Identify the statutory requirements of operating chromatographic instruments, e.g.: <ul style="list-style-type: none"> <li>○ use of radioactive substances in electron capture detector (ECD).</li> </ul> </li> <li>• Describe the procedures of carrying out routine performance check of chromatographic instruments.</li> <li>• Outline the steps of applying chromatographic techniques for identifying and quantifying analytes to give results in appropriate accuracy, precision, uncertainty and units.</li> <li>• Differentiate the applications of various types of chromatographic techniques according to the nature and characteristics of samples and analytes.</li> <li>• Apply the concepts of uncertainty and instrument calibration to chromatographic analysis.</li> </ul> <p>2. Apply and operate chromatographic instruments for chemical analysis</p> <ul style="list-style-type: none"> <li>• Determine the test request and identify sample characteristics that may affect the chemical analysis.</li> <li>• Select appropriate test method and chromatographic instrument in compliance with test requirements.</li> <li>• Carry out routine performance check of the selected chromatographic instrument according to manufacturer's instruction and/or relevant standard to ensure it is ready for chemical analysis.</li> <li>• Set up the chromatographic instrument and optimise its performance by using appropriate calibration standards and adjusting instrumental operating parameters.</li> <li>• Carry out chromatographic analysis on the sample independently according to the test method by measuring analyte responses for standards, validation and quality control checks, and the sample.</li> <li>• Record accurate and reliable chromatographic data by conducting sufficient measurements.</li> <li>• Analyse chromatographic data for chemical analysis.</li> </ul> <p>3. Exhibit professionalism</p>

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	<ul style="list-style-type: none"><li>• Troubleshoot analytical procedures or chromatographic instruments 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>• apply, optimise and operate the chromatographic instrument independently to carry out chemical analysis of the sample according to the test method and sample characteristics,</li><li>• record accurate and reliable chromatographic data by conducting sufficient measurements,</li><li>• analyse chromatographic data by verifying validation and quality control check data.</li></ul>
Remark	