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

Functional Area - Testing Operations

Title	Develop procedures for estimation of measurement uncertainty in chemical testing using EURACHEM approach
Code	105758L5
Range	This unit of competency (UoC) covers the abilities to develop procedures for estimating the measurement uncertainty in chemical testing using EURACHEM approach by evaluating all critical factors and the associated uncertainties in measurement steps in testing laboratories.
Level	5
Credit	4 （For Reference Only）
Competency	Performance Requirements 1. Possess knowledge and principles of estimating measurement uncertainty in chemical testing • Command the knowledge of statistics, e.g. mean, standard deviation, variance, standard deviation of the mean, degrees of freedom. • Explain the applications of various significance tests, e.g. t-test, F-test, analysis of variance (ANOVA), standard deviation of prediction, linear regression. • Employ the principles and procedures of relevant measurements. • Interpret the approaches such as bottom up, top down and using data from collaborative study, based on the nature of the test methods and measurements. • Determine the degree of rigour in estimation of measurement uncertainty to meet the requirements of intended use, test standards and/or regulatory specifications. • Examine and verify information from calibration certificates, equipment/apparatus/reagent specifications, validation data from trueness, recovery and precision studies, and quality control data. 2.Develop and document procedures for estimation of measurement uncertainty in chemical testing • Select an appropriate approach for estimation of measurement uncertainty in chemical testing. • Identify all critical factors affecting the overall measurement uncertainty. • Estimate the standard uncertainty of each factor and eliminate duplication. • Convert the standard uncertainty into relative standard uncertainty before combination. • Expand and calculate the method uncertainty range at the regulatory limits or other limits for making critical decision. • Critically control factors that contribute significantly to the measurement uncertainty to ensure the uncertainty satisfies regulatory tolerance/limits and/or specifications of test standards. • Review and re-evaluate the uncertainty regularly taking into account of the quality control data and variations of operation. • Document the procedures for estimation of measurement uncertainty in chemical testing 3.Exhibit professionalism • Consider all factors and estimate the measurement uncertainty appropriately and ensure its compliance with requirements of test standards and/or regulatory limits. • Ensure the control of experimental parameters critical to the results.
Assessment Criteria	The integrated outcome requirements of this UoC are the abilities to: • determine and justify the approaches for estimation of measurement uncertainty in chemical testing, • identify all factors affecting the measurement uncertainty and critically control factors that contribute significantly to the overall measurement uncertainty,

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	• develop and document the procedures for estimation of measurement uncertainty by applying the knowledge of statistics and approaches in compliance with requirements of test standards and/or regulatory limits.
Remark	