

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

Functional Area - Testing Operations

Title	Prepare standard solutions
Code	105795L3
Range	This unit of competency (UoC) covers the abilities to follow defined procedures and instructions to prepare and standardise solutions to be used in testing laboratories.
Level	3
Credit	2 (For Reference Only)
Competency	<p>Performance Requirements</p> <ol style="list-style-type: none"> 1. Possess practical knowledge of standard solution preparation <ul style="list-style-type: none"> • Apply solution terminology and concepts of metrology, e.g.: <ul style="list-style-type: none"> ○ acid / base solutions, buffers, redox reactions, ○ concepts of mass and volume measurements, ○ concepts of volumetric chemistry. • Identify the grades of glassware and chemicals required by the test method and describe their uses. • Describe the usage of primary and secondary standards and indicators. • Describe calculation methods including appropriate units, uncertainties, balancing equations, the concentration of solution given the chemical reaction for the titration. • Determine the factors affecting the shelf-life of the standard solutions. 2. Prepare standard solutions <ul style="list-style-type: none"> • Apply appropriate procedure for solution preparation. • Apply suitable laboratory apparatus, chemicals and solvent of specified purity for the preparation of standard solutions, e.g.: <ul style="list-style-type: none"> ○ volumetric glassware of appropriate grade, ○ balances, ○ pH meters. • Calculate and measure appropriate quantities of chemicals and solvents for standard solution preparation and record data. • Prepare standard solutions to achieve homogeneous mix of the specified concentration. • Standardise the solutions to the required specified range and precision by using volumetric titration with suitable primary standards and indicators. • Calculate the concentrations of the standard solutions. • Estimate the shelf-life of the standard solutions. • Label clearly and store properly the standard solutions in the laboratory. 3. Exhibit professionalism <ul style="list-style-type: none"> • Maintain the quality of the prepared standard solutions by performing usability checking, e.g. pH check, visual examination, date of expiry.
Assessment Criteria	<p>The integrated outcome requirements of this UoC are the abilities to:</p> <ul style="list-style-type: none"> • prepare standard solutions by using suitable laboratory apparatus, glassware, and chemicals in accordance with the requirements of test methods, • standardise the solutions and calculate the concentrations of the standard solutions accurately, • label and store the standard solutions properly in the laboratory to maintain their quality and integrity within the shelf-life.
Remark	