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

Functional Area - Testing Operations

Title	Evaluate electrical insulation properties by electrical measurements
Code	105821L4
Range	This unit of competency (UoC) covers the abilities to carry out electrical measurements on electrical and electronic products independently, record accurate test data and evaluate electrical insulation properties of the products by applying the knowledge of electrical insulation in testing laboratories.
Level	4
Credit	6 （For Reference Only）

Competency	Performance Requirements
	1. Possess knowledge of electrical insulation properties and electrical measurements
	• Employ the principles of electrical insulation, pollution degree and overvoltage category.
	• Identify the potential electrical hazards of selected electrical and electronic products, e.g.:
	  ○ audio, video and similar electronic apparatus,
	  ○ household and similar electrical appliances,
	  ○ information technology equipment,
	  ○ luminaires.
	• Describe how the material, construction and thickness of insulating layers affect the insulation properties, e.g. insulation resistance, electric strength, touch and protective impedance.
	• Employ the principles of evaluating electrical insulation properties by electrical measurements.
	• Specify the requirements of electrical insulation properties of selected electrical and electronic products in relevant categories of standards, e.g.:
	  ○ basic/generic standards, product family standards,
	  ○ international, national and industrial standards such as IEC, EN, GB, BS, UL, MS, SS, AS/NZS.
	• Specify the regulatory requirements of electrical insulation properties of electrical and electronic products in selected countries or regions, e.g. China, EU.
	• Describe the principles and operation of instruments used for the evaluation of electrical insulation by electrical measurements.
	• Apply the concepts of uncertainty and instrument calibration to the electrical measurements for evaluating electrical insulation properties.
	2. Evaluate electrical insulation properties by electrical measurements
	• Select appropriate test methods/standards and test conditions for electrical measurements.
	• Apply appropriate testing instruments and test site for electrical measurements.
	• Apply appropriate conditions to testing instruments, e.g.:
	  ○ test voltage for insulation resistance, permittivity and volume resistivity,
	  ○ test voltage, arc current set up and time for the cycle for dry arc resistance,
	  ○ value of high ac / dc current with low test voltage for ground continuity,
	  ○ frequency, RMS and peak value measurement of touch current.
	• Apply appropriate conditions to the sample under test, e.g.:
	  ○ conditioning, thermal cycling, abrasion resistance test, surge and/or impulse test before dielectric strength test,
	  ○ water absorption for permittivity and volume resistivity.
	• Carry out electrical measurements on the test sample independently according to the test methods/standards.

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	• Carry out required validation checks to confirm the system and instrumental requirements are met. • Record accurate test data and conclude test results to confirm the compliance of the test sample. 3. Exhibit professionalism • Ensure all measurements are carried out in compliance with good industry practices and relevant categories of standards. • Ensure integrity and confidentiality of laboratory data and information by observing the code of conduct as required by the standards, regulations and the organisation.
Assessment Criteria	The integrated outcome requirements of this UoC are the abilities to: • carry out electrical measurements on electrical insulation properties of selected electrical and electronic product independently by applying appropriate instruments and testing conditions according to the requirements of relevant test methods/standards, • record accurate and reliable test data by data validation and verifying instrument calibration status, • conclude test results to confirm the compliance of electrical insulation of the product against the relevant specifications of test methods/standards.
Remark	