

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

Functional Area - Testing Operations

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| Title | Evaluate electrical insulation properties by physical measurements |
| Code | 105822L4 |
| Range | This unit of competency (UoC) covers the abilities to carry out physical measurements on electrical and electronic products independently, record accurate test data and evaluate electrical insulation properties of the products in testing laboratories. |
| Level | 4 |
| Credit | 6 (For Reference Only) |
| Competency | <p>Performance Requirements</p> <p>1. Possess knowledge of electrical insulation properties and physical measurements</p> <ul style="list-style-type: none"> • Employ the principles of clearance and creepage distances. • Identify the material group based on pollution degree and comparative tracking index and describe the requirements of creepage distances of different material groups. • Identify basic, functional, supplementary and reinforced insulation. • Describe the effects of ingress of water and abnormal operation on clearance and creepage distances and how these distances affect electrical insulation properties. • Differentiate clearance and creepage distances. • Identify the potential electrical hazards of selected electrical and electronic products, e.g.: <ul style="list-style-type: none"> ○ audio, video and similar electronic apparatus, ○ household and similar electrical appliances, ○ information technology equipment, ○ luminaires. • Employ the principles of evaluating electrical insulation properties by: <ul style="list-style-type: none"> ○ measuring the clearance and creepage distance of different parts of the test samples, ○ proof tracking tests. • Specify the requirements of electrical insulation properties of selected electrical and electronic products in relevant categories of standards, e.g.: <ul style="list-style-type: none"> ○ 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 physical measurements. • Apply the concepts of uncertainty and instrument calibration to the physical measurements for evaluating the electrical insulation properties. <p>2. Evaluate electrical insulation properties by physical measurements</p> <ul style="list-style-type: none"> • Select appropriate test methods/standards and test conditions for physical measurements. • Apply appropriate testing instruments for clearance and creepage measurement, e.g. calliper and/or length/gap. • Apply appropriate conditions to testing instruments for the proof tracking test, e.g.: <ul style="list-style-type: none"> ○ concentration of ammonium chloride, ○ space of electrodes, ○ force applied, ○ volume of drops. |

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| | <ul style="list-style-type: none"> • Carry out physical measurements on the test sample independently according to the test methods/standards. • 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. <p>3. Exhibit professionalism</p> <ul style="list-style-type: none"> • 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 | <p>The integrated outcome requirements of this UoC are the abilities to:</p> <ul style="list-style-type: none"> • carry out physical 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 | |