



**Hong Kong Association for
Testing, Inspection and Certification Ltd.
Professional Certification Scheme for Testing Personnel**

**PCSTP04
SYLLABUS OF TRAINING COURSES**

First Issue
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Table of Content

Section	Section Title	Page
	Introduction	1
1	Definitions and Abbreviations	3
2	Chemical Testing	6
3	Construction Materials Testing	12
4	Electrical Products Testing	19
5	Microbiological Testing	27
6	Textiles and Garments Testing	31
7	Toys and Hardlines Testing	36
8.	Management Skills	43
9.	Laboratory Management	44
10.	Measurement Uncertainty	46
11.	Professional Ethics	47



INTRODUCTION

Hong Kong Association for Testing, Inspection and Certification Limited was first founded by a group of testing laboratories, inspection companies and certification bodies that recognized the growing importance of product testing, inspection and certification services in supporting further social and economic development in Hong Kong. In 1981, the Association was officially incorporated as an independent and non-profit making organization. Its primary objectives are:

1. to enhance the standard and quality of testing, calibration, inspection and certification for the furtherance of international trade and consumer satisfaction;
2. to ensure and promote the credibility of the services provided by members by establishing and maintaining a code of professional conduct;
3. to consider, investigate and inquire into all matters relating to the activities of testing, calibration, inspection and certification;
4. to collect and disseminate information relating to the activities of testing, calibration, inspection and certification or otherwise likely to be of interest to members and others;
5. to maintain a dialogue with the government and other bodies and organizations on all matters concerning the activities of standards, testing, calibration, inspection and certification; and
6. to coordinate the activities and promote co-operation among members.

The Association is managed by the General Committee which is elected by the members.

Determined to avert the lack of recognition of professional status of testing and certification personnel, a Professional Certification Scheme for Testing Personnel (PCSTP) was established in July 2011. Certification Criteria were established for the following six disciplines:

1. chemical testing
2. construction material testing
3. electrical products testing



4. microbiological testing
5. textiles and garments testing
6. toys and hardlines testing

Certification is subdivided into the levels, the Certified Testing Technician and Certified Testing Professional and sub-categories for most of the disciplines. The Scheme is developed under HKTIC (hereafter named as Certification Body) and managed by the Certification Board, which is responsible for the granting, reviewing and revising the personnel certification titles and requirements in accordance to the prevailing demand of the testing industries served by the scheme. The Certification Board, in turn, may appoint specialist Working Committees as it deems necessary to oversee specific parts of the scheme.

The Certification Board will be supported by the Programme Secretariat (PS) established under HKTIC and is responsible for the daily operation of the scheme.

Certificate of Achievement (satisfactory results in end of course evaluation) in approved training courses is an alternative path to be certified for testing personnel. This document outlines the syllabus of approved training courses required for complying with the certification criteria of testing personnel for different disciplines. The syllabus in this document will be amended from time to time and the training organizations approved or have applied for approval will be notified of the changes. Training organizations are free to have a course title different from those given in this document. Organizations can organize certificate, professional certificate or any one of the modular courses.



1 DEFINITIONS AND ABBREVIATIONS

- 1.1 **Appeal:** request by applicant, candidate or certified person for reconsideration of any adverse decision made by the certification body related to her/his desired certification status
- 1.2 **Authorised Qualifying Body (AQB):** an organisation reviewed and approved by the Certification Board to conduct and administer Certification Scheme examinations strictly in accordance with published requirements
- 1.3 **Approved Training Organisation (ATO):** An organisation assessed and approved to provide validated training courses specified by Certification Body for personnel intending to fulfill the competence requirements
- 1.4 **Candidate:** applicant who has fulfilled specified prerequisites and formally submitted application to join the certification process
- 1.5 **Certification process:** all activities by which a certification body establish that a person fulfils specified competence requirements, including application, evaluation, decision on certification, surveillance and recertification, use of certificates and logos/marks
- 1.6 **Certification scheme:** specific certification requirements related to specified categories of persons to which the same particular standards and rules, and the same procedures apply
- 1.7 **Certification system:** set of procedures and resources for carrying out the certification process as per certification scheme leading to the issue of a certificate of competence including maintenance demonstrated ability to apply knowledge and/or skills, and where relevant demonstrated personal attributes, as defined in the certification scheme
- 1.8 **Complaint:** conformity assessment request, other than appeal, by any organization or individual to a certification body, for corrective action relating to the activities of that body or to those of any of its customers
- 1.9 **Evaluation:** process that assesses a person's fulfillment of the requirements of the



scheme leading to the decision on certification

- 1.10 **Examination:** mechanism that is part of the evaluation, which measures a candidate's competence by one or more means such as written, oral, practical and observational
- 1.11 **Examiner:** person with relevant technical and personal qualifications, competent to evaluate the candidate applying for certification by either setting the examination questions and/or score an examination or be a professional interviewer as defined below
- 1.12 **Professional Interviewer:** person with relevant technical and personal qualifications, competent to conduct a professional assessment by interview in evaluation of candidate applying for certification
- 1.13 **Qualification:** demonstration of personal attributes, education, training and/or work experience
- 1.14 **Scope of certification:** the activities for which a person has been certified
- 1.15 **Scope of approval:** The location(s) of the Training Establishments and the training capacity for which the Training Organization is granted approval
- 1.16 **Suspension:** certification held in abeyance by HKTIC
- 1.17 **Termination:** withdrawal of certification
- 1.18 **Test category:** a name used to represent a branch of testing, calibration or other laboratory activity for which HKTIC provides certification under PCSTP
- 1.19 **Trainer:** person with relevant technical and personal qualifications, competent to conduct training courses for addressing the competence requirements of the certification scheme of testing personnel
- 1.20 **Training Establishment:** The training locations of the approved organizations which are included in the scope of approval
- 1.21 **Training Organization:** the company or other body approved under this Scheme.



Such approval may include one or more Training Establishments

1.22 **Voluntary termination:** termination requested in writing by a certified person

1.23 **PCSTP:** Professional Certification Scheme of Testing Personnel

1.24 **HKTIC:** Hong Kong Association for Testing, Inspection and Certification Limited

1.25 **TIC:** testing, inspection and certification

For any other terms not listed above, the relevant definitions in ISO/IEC 17000 and the International Vocabulary of Basic and General Terms in Metrology apply.



2 CHEMICAL TESTING

2.1 Certificate course for chemical testing (competence requirements for Certified Testing Technician)

The certificate course shall comprise of the following modules:

2.1.1 Understanding of ISO/IEC 17025 for chemical testing (knowledge) (~9 hours)

- Document control
- Verification of critical consumables
- Technical records
- Environmental conditions and prevention of contamination
- Traceability and use of CRM
- Sample handling such as storage conditions, etc.
- Sub-sampling requirements
- Quality control
 - Concept of quality control plan
 - Review of control chart
 - In process control checks to be implemented and their functions such as
 - Reagent blank
 - Method blank
 - Duplicate
 - Laboratory control sample
 - Spike

2.1.2 Laboratory safety for chemical laboratory (knowledge) (~ 6 hours)

- General laboratory safety
- Safety Symbol of chemicals
- Incompatible chemicals
- Handling, transport and storage of chemicals
- Chemical spillage
- Use of fire extinguisher caused by chemicals
- Handling and storage of waste, waste disposal
- Use of fume hood
- Guidebooks from Labour Department of HKSAR
 - A brief guide to first aid
 - A brief guide to the Occupational Safety and Health Ordinance



- A brief guide to the Occupational Safety and Health Regulation
- Code of practice on safety management
- Guidelines for good occupational hygiene practice in a workplace
- Hazards during chemicals in use and safety guidelines

2.1.3 Understanding on basic laboratory techniques and use of equipment for chemical tests (~24 hours)

Principles of basic laboratory techniques, related precautions, limitations and mal-practice for the following techniques:

- S.I. units and their use
- Cleansing of labware
- Special sample handling techniques
- pH and buffer solutions
- Gravimetric methods
- Volumetric analysis
 - Preparation of standard solutions
 - Titration
- Filtration and precipitation
- Digestion methods
 - Microwave, dry ash by muffle furnace and wet digestion/hot block digester
- Extraction methods
 - Solvent extraction, reflux/soxhlet extraction
- Cleanup methods
- Equipment
 - concept of calibration and performance checks
 - balance
 - pH meter
 - volumetric glassware
 - furnace and oven
 - autopipette
 - temperature measuring devices, thermohygrograph
 - daily check requirements of above equipment

2.2 Professional certificate for chemical testing (competence requirements for Certified testing Professional)

The professional certificate course shall comprise of the following modules except the Management Skill course as described in Section 2.2.1:



2.2.1 Management skill

The generic management skill course as described Section 8.1 in shall be followed.

2.2.2 Laboratory management in compliance with ISO/IEC 17025 (~18 hours)

- Overview of ISO/IEC 17025 and detailed knowledge in the following aspects
- Document control
- Review of contract
- Subcontracting
- Verification of critical consumables e.g.
 - Reagent water
 - SPE
 - Acid used for digestion
- Difference between correction and corrective actions and control of non-conforming work
- Preventive actions
- Technical records – test result, standard preparation
- Laboratory layout in segregation of activities and prevention of contamination
- Traceability (acceptable reference materials)
- Traceability (equipment)
- Verification of in-house reference materials
- Sample identification and integrity within laboratory
- Quality assurance procedures and plan
 - In-process control and their functions
 - Reagent blank
 - Method blank
 - Duplicate
 - Laboratory control sample
 - Spike
 - Statistical treatments of data and quality control requirement (detailed knowledge)
 - Basic statistics such as student-t, pair-t, F test, normal distribution
 - Establishment of control limit and precision criterion
 - Construction of control chart and identification of out of control cases



2.2.3 Laboratory safety for chemical laboratory (knowledge) (~ 7.5 hours)

- General laboratory safety
- Safety Symbol of chemicals
- Incompatible chemicals
- Handling, transport and storage of chemicals
- Chemical spillage
- Use of fire extinguisher caused by chemicals
- Handling and storage of waste, waste disposal
- Use of fume hood
- Licensed chemicals and equipment
- Material Safety data sheet
- Guidebooks from Labour Department of HKSAR
 - A brief guide to first aid
 - A brief guide to the Occupational Safety and Health Ordinance
 - A brief guide to the Occupational Safety and Health Regulation
 - Code of practice on safety management
 - Guidelines for good occupational hygiene practice in a workplace
 - Hazards during chemicals in use and safety guidelines

2.2.4 Measurement uncertainty for chemical tests (knowledge) (~21 hours)

- Approaches : EURACHEM , VAM
- Factors affecting uncertainty
 - Recovery/bias (imperfect recovery)
 - Precision (repeatability and intermediate precision)
 - Standard solution
 - End of measurement
- Approaches
 - Top down, bottom up and collaborative study
- Common problems
- Reporting of uncertainty and compliance
- Quality control and uncertainty
- Workshop and examples for different areas

2.2.5 Method validation for chemical tests (detailed knowledge) (~15 hours)

- Difference between verification and validation
- Method performance characteristics for qualitative and quantitative tests



- Definitions and method for determination of the characteristics such as linearity, LoD/MDL, LoQ/PQL
- International guidelines for setting criteria of such characteristics
- Procedures for method verification/validation
- Validation report
- Drafting of test procedures
- Workshop and examples

2.2.6 Principles of laboratory techniques and calibration/ performance check requirements for chemical tests (detailed knowledge) (~12 hours)

Principles of laboratory techniques, related precautions, limitations and mal-practice for the following techniques:

- S.I. units and their use
- Cleansing of labware
- Special sample handling techniques
- pH and buffer solutions
- Gravimetric methods
- Volumetric analysis
 - Preparation of standard solutions
 - Titration
- Filtration and precipitation
- Digestion methods
 - Microwave, dry ash by muffle furnace and wet digestion/hot block digester
- Extraction methods
 - Solvent extraction, reflux/soxhlet extraction
- Cleanup methods
- Equipment
 - Balance
 - pH meter
 - Volumetric glassware
 - Furnace and oven
 - Autopipette
 - Temperature measuring devices, thermohygrograph
 - Daily check requirements of above equipment
 - Ultraviolet and visible and colorimetric
 - Flow injection analyzer



2.2.7 Elemental or organic analysis (detailed knowledge) (~24 hours)

2.2.7.1 Elemental analysis

- Instrumental techniques (scope, limitations, principles, applications, maintenance and trouble shooting)
 - Flame photometer
 - Atomic absorption spectrometry/graphite atomic absorption spectrometry
 - Inductive couple plasma – atomic emission spectrometry
 - Inductive couple plasma – mass spectrometry
 - X-ray fluorescence

2.2.7.2 Organic analysis

- Extraction and cleanup method (scope, limitations and principles)
 - SPME, QuChers, GPC, etc.
- Instrumental techniques (scope, limitations, principles, applications, maintenance and trouble shooting)
 - GC- different detectors (FID, ECD, FPD, MSD)
 - LC- different detectors (RI, FLD, DAD, MSD, MSMS)
- Applications and examples

2.3 Candidate applying certification in one sub-category shall only need to attend the courses designated for that particular sub-category.



3 CONSTRUCTION MATERIALS TESTING

3.1 Certificate course for construction materials testing (competence requirements for Certified Testing Technician)

The certificate course shall comprise of the modules 3.1.1 to 3.1.2 and any one of 3.1.3 to 3.1.8.

3.1.1 Understanding of ISO/IEC 17025 (knowledge) (~4.5 hours)

- Document control
- Technical records
- Environmental conditions
- Equipment calibration requirements
- Sample handling such as storage conditions, etc.
- Quality control requirement

3.1.2 Laboratory safety (knowledge) (~4.5 hours)

- General laboratory and site safety precaution
- Handling of contaminated sample and radioactive equipment, etc.
- Personal protection in handling samples and equipment
- Measures in using large and heavy equipment in the laboratory and construction site
- Guidebooks from Labour Department of HKSAR
 - A brief guide to first aid
 - A brief guide to the Occupational Safety and Health Ordinance
 - A brief guide to the Occupational Safety and Health Regulation
 - Code of practice on safety management
 - Guidelines for good occupational hygiene practice in a workplace
 - Hazards during chemicals in use and safety guidelines

3.1.3 Understanding on basic laboratory techniques and use of equipment for Building Diagnostics (~15 hours)

3.1.3.1 Basic laboratory techniques and equipment (knowledge)

- Types of construction materials, outline knowledge on their usage and properties
- Temperature and tolerance for sampling and testing
- Sample maximum holding time



- Site sampling technique
- Sample conditioning requirement
- Checking and verification before testing
- Recording of test results
- Concept of calibration and performance checks
- Knowledge on general equipment
 - Balance and mass
 - Length measuring device
 - Linear displacement measuring devices
 - Pressure gauge and related calibrator
 - Temperature measuring device
 - Sieve
 - Compression, impact and tensile tester
 - Torque wrench
 - Time measuring devices
 - Condition chamber
 - Curing tank
 - Oven

3.1.3.2 Specific techniques and use of equipment

- infrared thermography
- radar wave
- covermeter
- carbonation
- half cell potential measurement
- concrete resistivity
- pundit test
- pull-off test
- rebound hammer test
- water leakage test

3.1.4 Understanding on basic laboratory techniques and use of equipment for Construction materials - Concrete, bituminous, sediment materials testing (~15 hours)

The basic laboratory techniques and use of equipment as described in 3.1.3.1 and the following shall be included:

- Materials
 - Aggregate



- Admixture
- Bituminous
- Block and brick
- Cement, FPA, GGBS
- Concrete
- Grout & mortar
- Tests
 - Abrasion
 - Compression, flexure, impact and tensile
 - Density
 - Hardness
 - Deformation test
 - Curing
 - Water absorption
 - Particle size distribution
 - Skid resistance
 - Classification tests
 - Triaxial & direct shear tests
 - In-situ density tests
- Equipment
 - Abrasion machine
 - Accelerated polishing machine
 - Vacuum gauge
 - Shear tester
 - Point Load tester
 - Nuclear density gauge
 - Volumetric measurement devices
 - Rammers and hammers
 - Tachometer
 - Marshall testing machine
 - Fineness testing apparatus
 - Chloride ion penetration tester
 - Compacting factor apparatus
 - Creep Testing apparatus
 - Flow cone and table
 - Anchor bolt pull out and proof load tester
 - Bending tester



- Extensometer
- Hardness tester

3.1.5 Understanding on basic laboratory techniques and use of equipment for Construction materials - Soil and rock testing (~15 hours)

Same tests and equipment as 3.1.4 apply.

3.1.6 Understanding on basic laboratory techniques and use of equipment for Construction materials - All steel and metallic testing (~8 hours)

Same tests and equipment as 3.1.4 apply.

3.1.7 Understanding on basic laboratory techniques and use of equipment for Foundation testing (~8 hours)

The basic laboratory techniques and use of equipment as described in 3.1.3.1 and the following shall be included:

- Tests
 - Sonic Logging Test (SOLT)
 - Pile Integrity Test (PIT)
 - Pile Dynamic Test (PDA)
 - Static Loading Test (SLT)
 - Plate Loading Test (PLT)
 - Ultrasonic Echo Sounder Test (UEST)
- Equipment
 - Accelerometer
 - Strain gauge
 - Oscilloscope or cathode ray tube or frequency analyzer and standard
 - Sonic logger

3.1.8 Understanding on basic laboratory techniques and use of equipment for Welding non-destructive testing (~4 hours)

The basic laboratory techniques and use of equipment as described in 3.1.3.1 and the following shall be included:

- Tests
 - Ultrasonic testing (UT)
 - Magnetic Particle testing (MT)
 - Liquid Penetrant testing (PT)
 - Radiographic testing (RT)



- Visual Examination (VE)
- Equipment
 - Ultrasonic probe
 - Ultrasonic flaw detector
 - UV /white light meter
 - magnetic yokes
 - X-ray equipment
 - Radiograph
 - Image quality indicator
 - Radiograph survey meter

3.2 Professional certificate for construction materials testing (competence requirements for Certified testing Professional)

The professional certificate course shall comprise of the modules 3.2.2 to 3.2.4 and any one of 3.2.5 to 3.2.10.

3.2.1 Management skill

The generic management skill course as described Section 8.1 in shall be followed.

3.2.2 Laboratory management in compliance with ISO/IEC 17025

The generic laboratory management in compliance with ISO/IEC 17025 for physical and electrical testing course as described Section 9.1 in shall be followed.

3.2.3 Laboratory safety (knowledge)

The generic laboratory safety course as described in Section 9.2 shall be followed.

3.2.4 Evaluation of measurement uncertainty by Guide to Uncertainty of Expression of Measurements (knowledge)

The generic Evaluation of measurement uncertainty by Guide to Uncertainty of Expression of Measurements course as described in Section 10.1 shall be followed.

3.2.5 Principles of laboratory techniques and calibration of equipment for Building Diagnostics (detailed knowledge) (~8 hours)

The same laboratory techniques and list of equipment as described in 3.1.3 shall be followed. Detailed knowledge in test and legislation requirements as listed in 3.3 is also required.



- 3.2.6 Principles of laboratory techniques and calibration of equipment for Construction materials - Concrete, bituminous, sediment materials testing (detailed knowledge) (~8 hours)

The same laboratory techniques and list of equipment as described in 3.1.4 shall be followed. Detailed knowledge in test and legislation requirements as listed in 3.3 is also required.

- 3.2.7 Principles of laboratory techniques and calibration of equipment for Construction materials - Soil and rock testing (detailed knowledge) (~8 hours)

The same laboratory techniques and list of equipment as described in 3.1.5 shall be followed. Detailed knowledge in test and legislation requirements as listed in 3.3 is also required.

- 3.2.8 Principles of laboratory techniques and calibration of equipment for Construction materials - All steel and metallic testing (detailed knowledge) (~8 hours)

The same laboratory techniques and list of equipment as described in 3.1.6 shall be followed. Detailed knowledge in test and legislation requirements as listed in 3.3 is also required.

- 3.2.9 Principles of laboratory techniques and calibration of equipment for Foundation testing (detailed knowledge) (~8 hours)

The same laboratory techniques and list of equipment as described in 3.1.7 shall be followed. Detailed knowledge in test and legislation requirements as listed in 3.3 is also required.

- 3.2.10 Principles of laboratory techniques and calibration of equipment for Welding non-destructive testing (detailed knowledge) (~8 hours)

The same laboratory techniques and list of equipment as described in 3.1.8 shall be followed. Detailed knowledge in test and legislation requirements as listed in 3.3 is also required.

- 3.3 Test and legislation requirements (detailed knowledge)

- Hong Kong Construction Standard, e.g. CS 1 and CS 2, etc
- Hong Kong Government Works Department Specifications
- Buildings Department Code of Practices
- Hong Kong Concrete Institute test method, e.g. TM 1, TM 2 and TM 3, etc



- Chinese Standard, e.g. GB, GB/T, etc
- British Standard, e.g. BS
- American Standard, e.g. ASTM, API, AWS, ANSI/UL, ANSI/NSF
- Japanese Standard, e.g. JIS
- Australian Standard, e.g. AS
- European Norm, e.g. EN
- International Standard, e.g. ISO, IEC, etc.

3.4 Candidate applying certification in one sub-category shall only need to attend the courses designated for that particular sub-category.



4 ELECTRICAL PRODUCTS TESTING

4.1 Certificate course for electrical products testing (competence requirements for Certified Testing Technician)

The certificate course shall comprise of the modules 4.1.1 to 4.1.2 and any one of 4.1.3 to 4.1.5. Details of requirements of measurements other than the specific tests are given in 4.3.

4.1.1 Understanding of ISO/IEC 17025 (knowledge) (~4.5 hours)

- Document control
- Technical records
- Environmental conditions
- Equipment calibration requirements
- Sample handling such as storage conditions, etc.
- Quality control requirement

4.1.2 Laboratory safety (knowledge) (~4.5 hours)

- General laboratory safety
- AS2243 Part 7 Safety in Laboratories Electrical aspects
- BS EN 61010-2 Safety requirements for electrical equipment for measurement, control and laboratory use
- Guidebooks from Labour Department of HKSAR
 - A brief guide to first aid
 - A brief guide to the Occupational Safety and Health Ordinance
 - A brief guide to the Occupational Safety and Health Regulation
 - Code of practice on safety management
 - Guidance notes on fire safety at workplaces
 - Guidelines for good occupational hygiene practice in a workplace
 - Hazards during chemicals in use and safety guidelines

4.1.3 Understanding on measurement methods and use of equipment for Safety tests (~40 hours)

Related precautions, limitations and mal-practice of the following techniques and equipment shall be described:



4.1.3.1 Common measurement methods and use of equipment

- Understanding of common electrical and electronic components, such as various types of motors, insulation, electronic components including semiconductor devices, transformers, fuses and means of electrical connections (i.e. different types of connectors, size of wires, etc.), and how they affect safety.
- Connection diagram
- Equipment
 - Signal generator
 - Multi meter
 - Frequency converter
 - Length measuring devices
 - Weight measuring devices
 - Force measuring devices

4.1.3.2 Specific requirements

- Measurements
 - Electrical measurements
 - Temperature measurements
 - Physical and mechanical measurements
 - Materials analysis
- Requirements of test standards
 - Test standards for safety tests as given in 4.4.
- Equipment
 - Ball pressure test apparatus
 - Environmental chambers
 - Fixtures and dimension gauges
 - Force and torque gauges
 - Glow-wire test apparatus
 - Leakage current meter
 - Spectrum analyzers
 - Spring operated impact hammers
 - Surge generators
 - Temperature recorders
 - Test fingers
 - High port tester
 - Tracking tester
 - Power analyzers



- Oscilloscope

4.1.4 Understanding on basic laboratory techniques and use of equipment for Electromagnetic compatibility tests (~32 hours)

4.1.4.1 The basic laboratory techniques and use of equipment as described in 4.1.3.1 shall be included.

4.1.4.2 Specific requirements

- Measurements
 - Electrical measurements
 - Time and frequency
 - EMC tests
- Test standards
 - Test standards for electromagnetic compatibility tests as given in 4.4.
- Equipment
 - Anechoic chambers
 - Antennae
 - Absorbing clamps
 - Electromagnetic field probes
 - EMI Receivers
 - Environmental chambers
 - ESD Guns
 - Fast transient burst generators
 - LISN
 - Spectrum analyzers
 - Surge generators
 - Voltage dip generators
 - Oscilloscope

4.1.5 Understanding on basic laboratory techniques and use of equipment for Green tests (~40 hours)

4.1.5.1 The basic laboratory techniques and use of equipment as described in 4.1.3.1 shall be included.

4.1.5.2 Specific requirements

- Measurements



- Electrical measurement
- Temperature measurement
- Thermo radiation
- Material analysis
- Test standards
 - Test standards for green tests as given in 4.4.
- Equipment
 - Environmental chambers
 - Oscilloscope

4.2 Professional certificate for electrical products testing (competence requirements for Certified testing Professional)

The professional certificate course shall comprise of the modules 4.2.2 to 4.2.4 and any one of 4.2.5 to 4.2.7.

4.2.1 Management skill

The generic management skill course as described Section 8.1 in shall be followed.

4.2.2 Laboratory management in compliance with ISO/IEC 17025

The generic laboratory management in compliance with ISO/IEC 17025 for physical and electrical testing course as described Section 9.1 in shall be followed.

4.2.3 Laboratory safety (knowledge)

The generic laboratory safety course as described in Section 9.2 shall be followed.

4.2.4 Evaluation of measurement uncertainty by Guide to Uncertainty of Expression of Measurements (knowledge)

The generic Evaluation of measurement uncertainty by Guide to Uncertainty of Expression of Measurements course as described in Section 10.1 shall be followed.

4.2.5 Principles of laboratory techniques and calibration of equipment for Safety tests (detailed knowledge) (~60 hours)

The same laboratory techniques and list of equipment as described in 4.1.3 shall be followed.

4.2.6 Principles of laboratory techniques and calibration of equipment for EMC tests



(detailed knowledge) (~45 hours)

The same laboratory techniques and list of equipment as described in 4.1.4 shall be followed.

4.2.7 Principles of laboratory techniques and calibration of equipment for Green tests
(detailed knowledge) (~60 hours)

The same laboratory techniques and list of equipment as described in 4.1.5 shall be followed.

4.3 Measurements techniques

4.3.1 Electrical Measurements

- measurement of resistance
- principles of operation of digital multimeters and calibrators
- measurement of direct voltage and current
- principles of calibration
- measurement of alternating voltage and current
- measurement of high voltage
- guarding, grounding and shielding
- cables and connectors

4.3.2 Electromagnetic Compatibility (EMC)

4.3.2.1 Emission tests

- Types of interference and their measurements
- Harmonic current
- Voltage fluctuation and flicker

4.3.2.2 Immunity tests

- radio-frequency fields susceptibility
- Electrical fast transient/ burst susceptibility
- Electrostatic discharge susceptibility
- Surge susceptibility
- Voltage dips, short interruption and voltage variation susceptibility

4.3.3 Physical and mechanical tests

- distinguish creepage distances and clearances
- use of Length or gap gauges
- means to protect probes, pins and gauge from rusting



- Linear and angular measurement
- Roundness Evaluation Methods
- Durameters Eddy Current and Indentation Testing, Range and Application of Scales, Conversion Relationships for hardness measurements
- Roughness average
- Mass and weight principles
- Weighing instruments, Classes, selection,
- Physical influences
- Stress and strain, Characteristics & operations of a load cell
- Torque concepts and applications, Torque testers calibration
- Vibration amplitude and vibration frequencies, vibration Parameters, motion, and Degrees of Freedom, the Selection of Acceleration, Velocity and Displacement Parameters

4.3.4 Material Analysis

- Flammability tests
 - Types of flammability and their measurements
 - Glow wire tests
 - Ball pressure tests
 - Needle flame tests
- Tracking tests

4.3.5 Temperature Measurements

- physics of temperature measurement
- temperature scale, traceability and international standards
- thermocouple electromotive force, measurement and calibration
- properties of thermocouples and systematic errors

4.3.6 Thermo radiation

- SI units
- Wave and particles model and speed of propagation
- Thermal radiation and electromagnetic radiation as a form of heat and its measurement
- Electromagnetic spectrum – light and radio waves and their measurements

4.3.7 Time and Frequency Measurements

- clocks, oscillators and frequency standards



- time scales and international timekeeping
- evaluating the performance of time and frequency standards
- selection of clocks and oscillators to suit applications
- computer time and Network Time Protocol
- frequency and time interval measuring instruments
- measurement and analysis techniques for time and frequency calibrations
- rf and microwave devices
- fibre optics background

4.4 Test standards

4.4.1 Test standards for Safety tests

- *IEC 60950 (UL 60950)* Information technology equipment – Safety
- *IEC 60065 (UL60065)* Audio, video and similar electronic apparatus - Safety requirements
- *IEC 60335* Safety of electrical household appliances
- *IEC 60598 (UL 1598)* Luminaires
- *IEC 60601* Medical Electrical Equipment

4.4.2 Test standards for Electromagnetic compatibility tests

- *IEC61000-3-2* Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)
- *IEC61000-3-3* Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection
- *EN 55013* Sound and television broadcast receivers and associated equipment. Radio disturbance characteristics. Limits and methods of measurement
- *EN55014* Electromagnetic compatibility. Requirements for household appliances, electric tools and similar apparatus. Emission
- *EN55020* Sound and television broadcast receivers and associated equipment. Immunity characteristics. Limits and methods of measurement
- *EN55022* Information technology equipment. Radio disturbance characteristics. Limits and methods of measurement
- *ETSI EN301 489* ElectroMagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services
- *ESTI EN300 220* ElectroMagnetic compatibility and Radio spectrum Matters



(ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services

4.4.3 Test standards for Green tests

- *IEC 62087* Methods of measurement for the power consumption of audio, video and related equipment
- *IEC 62301* Household electrical appliances - Measurement of standby power
- *AS/NZS 4665.1 /2* Performance of External Power Supplies
- *IEC 62552* Household Refrigerating Appliances – Characteristics and test methods
- *ISO 5151* Non-ducted air conditioners and heat pumps -- Testing and rating for performance
- *ANSI/AHAM DH-1* Dehumidifiers
- *IEC 60379* Methods for measuring the performance of electric storage water-heaters for household purposes
- *IEC 60456* Clothes washing machines for household use – Methods for measuring the performance
- *IEC 60969* Self-ballasted lamps for general lighting services Performance requirements
- *CIE 84* Measurement of Luminous Flux
- *IEC 61341* Method of measurement of centre beam intensity and beam angle(s) of reflector lamps
- *IEC/PAS 62612* Self-ballasted LED-lamps for general lighting services - Performance requirements

4.5 Candidates applying certification in one sub-category shall only need to attend the courses designated for that particular sub-category.



5 MICROBIOLOGICAL TESTING

5.1 Certificate course for microbiological testing (competence requirements for Certified Testing Technician)

The certificate course shall comprise of the modules 5.1.1 to 5.1.3.

5.1.1 Understanding of ISO/IEC 17025 (knowledge) (~6 hours)

- Document control
- Verification of critical consumables
- Technical records
- Environmental conditions
- Sample handling such as storage conditions, etc.
- Traceability and reference culture
- Quality control requirement
 - In process control checks to be implemented such as
 - Sterility check
 - positive and negative strain
 - duplicate analysis

5.1.2 Laboratory safety (knowledge) (~6 hours)

- General laboratory and biosafety precaution
- Handling of broken glass, contaminated sample, sharp point, etc.
- First and second protection barrier
- Measures in using high pressure autoclave
- Personal protection in handling samples and equipment
- AS/NZS 2243.3 Safety in Laboratories Microbiological aspects and containment facilities
- Guidebooks from Labour Department of HKSAR
 - A brief guide to first aid
 - A brief guide to the Occupational Safety and Health Ordinance
 - A brief guide to the Occupational Safety and Health Regulation
 - Code of practice on safety management
 - Guidelines for good occupational hygiene practice in a workplace

5.1.3 Understanding on basic laboratory techniques and use of equipment for microbiological testing (~30 hours)



- Aseptic, staining, pour plate, streak plate and membrane filtration technique
- Autoclave requirement
- Expected results for biochemical or other confirmation tests
- Counting and use of microscope
- Temperature and tolerance for incubation
- Sample maximum holding time of samples
- Sample preparation requirements
- Equipment usage (knowledge)
 - Autoclave
 - Monitoring of temperature of each cycle
 - Oven
 - Incubator
 - Freezer/refrigerator/cold storage room
 - Biohazard hood or laminar flow cabinet
 - Temperature monitoring device
 - Balance
 - Pipette/autopipette

5.2 Professional certificate for microbiological testing (competence requirements for Certified testing Professional)

The professional certificate course shall comprise of the modules 5.2.2 to 5.2.5.

5.2.1 Management skill

The generic management skill course as described Section 8.1 in shall be followed.

5.2.2 Laboratory management in compliance with ISO/IEC 17025 (detailed knowledge in the following aspects) (~21 hours)

- Document control
- Review of contract
- Subcontracting
- Verification of critical consumables
 - Reagent water
 - Quantitative evaluation of medium (based on ISO/TS 11133-1)
 - Serological/biological kit
 - Labware
- Difference between correction and corrective actions and control of



non-conforming work

- Preventive actions
- Technical records – test result, medium preparation, subculture history, etc.
- Laboratory layout in segregation of activities and prevention of contamination
- Traceability (acceptable reference culture)
 - Procedures of sub-culture
 - Verification of working culture
- Sample identification and integrity within laboratory
- Statistical treatments of data and quality control requirement
 - Establishment of control limit and precision criterion
 - Construction of control chart
 - Quality control check
 - Negative and positive strain for confirmation test
 - Subculture and verification of reference culture procedures
 - Storage period of working culture, broth and medium
 - In-process control checks

5.2.3 Laboratory safety (knowledge) (~7.5 hours)

- Handling of spill
- Principles in use of different disinfectant
- General laboratory safety and biosafety precaution
- Handling of broken glass, contaminated sample, sharp point, etc.
- First and second barrier
- Measures in using high pressure autoclave
- Personal protection in handling samples and equipment
- AS/NZS 2243.3 Safety in Laboratories Microbiological aspects and containment facilities
- Guidebooks from Labour Department of HKSAR
 - A brief guide to first aid
 - A brief guide to the Occupational Safety and Health Ordinance
 - A brief guide to the Occupational Safety and Health Regulation
 - Code of practice on safety management
 - Guidelines for good occupational hygiene practice in a workplace

5.2.4 Equipment calibration and evaluation of measurement uncertainty (knowledge) (~15 hours)



- Approaches for estimation of measurement uncertainty e.g. EURACHEM, MIKE
- Factors affecting measurement uncertainty
- Intermediate precision based on ISO5725-3 and additional consideration
- Uncertainty of one-off analysis
- Reporting of uncertainty and compliance
- Calibration requirements of equipment
 - the list of equipment as CTT

5.2.5 Principles of laboratory techniques and calibration of equipment for Microbiological testing (detailed knowledge) (~36 hours)

- The same basic techniques as CTT
- Underlying principles of the techniques
- Implication of the microbial being identified
- Difference between indicator and pathogen
- Precautions and limitation for microbiological testing of different matrices



6 TEXTILES AND GARMENTS TESTING

6.1 Certificate course for textiles and garments testing (competence requirements for Certified Testing Technician)

The certificate course shall comprise of the modules 6.1.1 to 6.1.2 and any one of 6.1.3 to 6.1.6.

6.1.1 Understanding of ISO/IEC 17025 (knowledge) (~4.5 hours)

- Document control
- Verification of critical consumables
- Technical records
- Environmental conditions and pre-conditioning requirements
- Sampling
- Traceability of equipment and evaluation tests
- Quality control requirement
- Concept of quality control plan
 - In process control checks to be implemented such as
 - Control for visual assessment tests
 - Concept of laboratory control sample
 - replicate analysis

6.1.2 Laboratory safety (knowledge) (~4.5 hours)

- General laboratory and site safety precaution
- Personal protection for handling samples and equipment
- Precautions in performing flammability tests
- Measures in using large and heavy equipment in the laboratory
- Laboratory fume cupboards BS 7258
- Guidebooks from Labour Department of HKSAR
 - A brief guide to first aid
 - A brief guide to the Occupational Safety and Health Ordinance
 - A brief guide to the Occupational Safety and Health Regulation
 - Code of practice on safety management
 - Guidelines for good occupational hygiene practice in a workplace
 - Hazards during chemicals in use and safety guidelines



6.1.3 Understanding on basic laboratory techniques and use of equipment for Color fastness and care performance tests (~24 hours)

6.1.3.1 Basic requirements and use of equipment

- Understanding of terms used for textiles and garments
- Knowledge on Regulatory requirements
- Specimen preparation
- Sample conditioning requirements
- Concept of calibration and performance check
- Length measurement
- Cutting die
- Temperature and humidity monitoring device
- Selection of appropriate equipment in meeting the accuracy of the tests Equipment

6.1.3.2 Specific requirements

Knowledge on requirements of one of the two mandatory standards (ISO or AATCC and ASTM):

- Colour Fastness Assessment, e.g. Light, Washing, Dry-cleaning, Hot Pressing, Perspiration, Water, etc.
- Controls used for different visual tests
- Care Performance Tests, e.g. Dimensional Stability to and Appearance after Washing, Dry-cleaning
- Assessment methods and related requirements of assessment room or chamber
- Recording of results
- Equipment
 - Crockmeter
 - Drycleaning Cylinder
 - Fade-o-meter
 - Perspiration Tester
 - Wascator
 - Washer
 - Wira Steam Cylinder

6.1.4 Understanding on basic laboratory techniques and use of equipment for Construction and Physical Performance tests (~24 hours)

6.1.4.1 The same basic laboratory techniques as described in 6.1.3.1 apply.



6.1.4.2 Specific requirements

Knowledge on requirements of one of the two mandatory standards (ISO or AATCC and ASTM) and one of the other standards as given in 6.3 for the following:

- Construction Tests for Fabric, e.g. Fabric Weight, Density, Yarn Size
- Strength and Durability Tests, e.g. Tensile, Tear, Abrasion Resistance
- Performance Tests required Visual Grading, e.g. Pilling Resistance, Snagging Resistance, etc.
- Other Performance Tests, e.g. Air permeability, Water Repellency and Resistance, etc.
- Knowledge on the above tests and factors affecting the results
- Number of determinations required
- Equipment
 - Abrasion Tester (Inflated Diaphragm)
 - Abrasion Tester (Martindale)
 - Bursting Tester
 - Elmendorf Tearing Tester
 - Rain tester
 - Spray tester
 - ICI Pilling Box
 - Random Tumbler
 - Tensile tester
 - Temperature and humidity monitoring device

6.1.5 Understanding on basic laboratory techniques and use of equipment for Fibre Analysis (~24 hours)

6.1.5.1 The same basic laboratory techniques as described in 6.1.3.1 apply.

6.1.5.2 Specific requirements

Knowledge on requirements of the two mandatory standards (AATCC 20/20A):

- Test Methods of Qualitative and Quantitative Analysis of Fibres and Blends
- Extract Solvents of Textile Materials
- Moisture Regain Determination
- Types of fibres and expected results of solvent tests of different fibre type
- Equipment
 - Microscope



- Balance
- FTIR

6.1.6 Understanding on basic laboratory techniques and use of equipment for Flammability safety tests (~24 hours)

6.1.6.1 The same basic laboratory techniques as described in 6.1.3.1 apply.

6.1.6.2 Specific requirements

Knowledge on requirements of the mandatory standards (CFR (1610/1615/1616/1630/1631) and ASTM for the following:

- Flammability Tests for Textile and Garments
- Flammability Tests for carpets and rugs
- Pre-conditioning requirements and requirements of testing chamber
- Number of determinations and pre-treatment such as drycleaning for different test standard
- Equipment
 - Flammability Tester (CFR1610)
 - Flammability Tester (CFR1615)

6.2 Professional certificate for textiles and garments testing (competence requirements for Certified testing Professional)

The professional certificate course shall comprise of the modules 6.2.2 to 6.2.4 and any two of 6.2.5 to 6.2.8.

6.2.1 Management skill

The generic management skill course as described Section 8.1 in shall be followed.

6.2.2 Laboratory management in compliance with ISO/IEC 17025

The generic laboratory management in compliance with ISO/IEC 17025 for physical and electrical testing course as described Section 9.1 in shall be followed.

6.2.3 Laboratory safety (knowledge)

The generic laboratory safety course as described in Section 9.2 shall be followed.

6.2.4 Evaluation of measurement uncertainty by Guide to Uncertainty of Expression of



Measurements (knowledge)

The generic Evaluation of measurement uncertainty by Guide to Uncertainty of Expression of Measurements course as described in Section 10.1 shall be followed.

- 6.2.5 Principles of laboratory techniques and calibration of equipment for Color fastness and care performance tests (detailed knowledge) (~40 hours)

The same laboratory techniques and list of equipment as described in 6.1.3 shall be followed.

- 6.2.6 Principles of laboratory techniques and calibration of equipment for Construction and Physical Performance tests (detailed knowledge) (~40 hours)

The same laboratory techniques and list of equipment as described in 6.1.4 shall be followed.

- 6.2.7 Principles of laboratory techniques and calibration of equipment for Fibre Analysis (detailed knowledge) (~40 hours)

The same laboratory techniques and list of equipment as described in 6.1.5 shall be followed.

- 6.2.8 Principles of laboratory techniques and calibration of equipment for Flammability safety tests (detailed knowledge) (~40 hours)

The same laboratory techniques and list of equipment as described in 6.1.6 shall be followed.

- 6.3 Candidates applying certification in one sub-category shall only need to attend the courses designated for that particular sub-category.



7 TOYS AND HARDLINES TESTING

7.1 Certificate course for toys and hardlines testing (competence requirements for Certified Testing Technician)

The certificate course shall comprise of the modules 7.1.1 to 7.1.2 and any one of 7.1.3 or 7.1.4.

7.1.1 Understanding of ISO/IEC 17025 (knowledge) (~4.5 hours)

- Document control
- Technical records – force diagram
- Environmental conditions
- Equipment calibration requirements
- Sample handling such as storage conditions, etc.
- Quality control requirement

7.1.2 Laboratory safety (knowledge) (~4.5 hours)

- General laboratory and site safety precaution
- Personal protection in handling samples and equipment
- Measures in using large and heavy equipment and/or samples in the laboratory
- Safety in performing flammability tests
- Laboratory fume cupboards BS 7258
- Guidebooks from Labour Department of HKSAR
 - A brief guide to first aid
 - A brief guide to the Occupational Safety and Health Ordinance
 - A brief guide to the Occupational Safety and Health Regulation
 - Code of practice on safety management
 - Guidelines for good occupational hygiene practice in a workplace

7.1.3 Understanding on basic laboratory techniques, related precautions, limitations and mal-practice and use of equipment for toys and children's products tests (~36 hours)

- Understanding of load and force, use of test fixture and application of force, abuse test, durability and stability test
- The criteria for selection of measurement equipment
- Understanding of equipment calibration and measurement traceability, S.I. units
- Conversion between metric and English scale



- Measurements as given in 7.3
 - Mass, weight, force and torque measurements
 - Dimensional, angular, roundness, hardness and texture measurements
 - Time measurements
 - Flammability Measurements
 - Temperature measurements
 - Acoustic measurements
- Requirements of test standards as given in 7.4
- Equipment
 - Mass/load
 - Balance
 - Length measuring devices
 - Humidity measuring devices
 - Temperature measuring devices
 - Time measuring devices
 - Torque and tension gauge
 - Angular measuring devices
 - Fixture
 - Sharp point tester
 - Impact medium
 - Sharp edge tester
 - Sound level meter
 - Flux meter
 - Ohmmeter
 - Bite tester
 - Flammability tester in compliance with CFR1610
 - Flow meter
 - burner

7.1.4 Understanding on basic laboratory techniques, related precautions, limitations and mal-practice and use of equipment for Hardlines tests (~36 hours)

- Understanding of load and force, use of test fixture and application of force, abuse test, durability and stability test
- The criteria for selection of measurement equipment
- Understanding of equipment calibration and measurement traceability, S.I. units
- Conversion between metric and English scale
- Measurements as given in 7.3



- Mass, weight, force and torque measurements
- Dimensional, angular, roundness, hardness and texture measurements
- Time measurements
- Flammability Measurements
- Temperature measurements
- Acoustic measurements
- Requirements of test standards of two product types as given in 7.4
- Equipment
 - Mass/load
 - Balance
 - Length measuring devices
 - Humidity measuring devices
 - Temperature measuring devices
 - Time measuring devices
 - Torque and tension gauge
 - Angular measuring devices
 - Fixture
 - Sharp point tester
 - Impact medium
 - Sharp edge tester

7.2 Professional certificate for toys and hardlines testing (competence requirements for Certified testing Professional)

The professional certificate course shall comprise of the modules 7.2.2 to 7.2.4 and any one of 7.2.5 or 7.2.6.

7.2.1 Management skill

The generic management skill course as described Section 8.1 in shall be followed.

7.2.2 Laboratory management in compliance with ISO/IEC 17025

The generic laboratory management in compliance with ISO/IEC 17025 for physical and electrical testing course as described Section 9.1 in shall be followed.

7.2.3 Laboratory safety (knowledge)

The generic laboratory safety course as described in Section 9.2 shall be followed.



7.2.4 Evaluation of measurement uncertainty by Guide to Uncertainty of Expression of Measurements (knowledge)

The generic Evaluation of measurement uncertainty by Guide to Uncertainty of Expression of Measurements course as described in Section 10.1 shall be followed.

7.2.5 Principles of laboratory techniques and calibration of equipment for Toys and Children's Products testing (detailed knowledge) (~40 hours)

The same laboratory techniques and list of equipment as described in 7.1.3 shall be followed. Rationale and method verification shall also be covered. Detailed knowledge of requirements of all test standards as given in 7.4 are required.

7.2.6 Principles of laboratory techniques and calibration of equipment for Hardlines testing (detailed knowledge) (~40 hours)

The same laboratory techniques and list of equipment as described in 7.1.4 shall be followed. Rationale and method verification shall also be covered.

7.3 Measurement Methods

7.3.1 Mass, weight, force and torque measurements

- Mass and weight principles
- Weighing instruments, Classes, selection
- Physical influences
- Stress and strain, Characteristics & operations of a load cell
- Torque concepts and applications, Torque testers calibration
- Moment

7.3.2 Dimensional, angular, roundness, hardness and texture measurements

- Linear and angular measurement standards
- Angular measurements
- Roundness Evaluation Methods
- Hardness measurements, scale and conversion
- Volume measurements

7.3.3 Time measurements

- clocks, oscillators and frequency standards
- time scales and international timekeeping
- evaluating the performance of time and frequency standards



- measurement and analysis techniques for time calibrations

7.3.4 Flammability Measurements

- Pre-conditioning requirements
- Evaluation of burn rate
- Angle of application
- Type of fuel and burner
- Air flow of testing environment
- Temperature zone of a flame

7.3.5 Temperature Measurements

- physics of temperature measurement
- temperature scale, traceability and international standards
- thermocouple electromotive force, measurement and calibration
- properties of thermocouples and systematic errors

7.3.6 Acoustics measurements

- Units of Measure used to Quantify Sound, Components of the Ear coupler, Calibration of an Acoustic Meter and its use, Basic Types of Sound Field Microphones
- A weighed and C weighed
- Position and factors affecting the measurements

7.4 Test standards for different sub-categories

7.4.1 Toys (Toys and children's products)

- *ASTM F963 - 08* Standard Consumer Safety Specification for Toy Safety
- *EN 71-1:2011* Safety of toys - Part 1: Mechanical and physical properties
- *EN 71-2:2011* Safety of toys - Part 2: Flammability

7.4.2 Children's products (Toys and children's products)

- *ASTM F833 - 11* Standard Consumer Safety Performance Specification for Carriages and Strollers
- *EN1888:2003* Child care articles. Wheeled child conveyances. Safety requirements and test methods
- *ASTM F2236 - 10* Standard Consumer Safety Specification for Soft Infant Carriers
- *EN13209-1:2004* Child use and care articles. Baby carriers. Safety requirements



and test methods.

- *EN 14372:2004* Child use and care articles. Cutlery and feeding utensils. Safety requirements and tests
- *EN14350-1:2004* Child use and care articles. Drinking equipment. General and mechanical requirements and tests
- *EN1400-1:2002* Child use and care articles. Soothers for babies and young children. General safety requirements and product information
- *EN1400-2:2002* Child use and care articles. Soothers for babies and young children. Mechanical requirements and tests

7.4.3 Candle (Hardlines)

- *ASTM F2601 - 09* Standard Specification for Fire Safety for Candle Accessories
- *ASTM F2058 - 07* Standard Specification for Candle Fire Safety Labeling
- *ASTM F2417 - 09* Standard Specification for Fire Safety for Candles
- *EN15426:2007* Candles. Specification for sooting behavior
- *EN15493:2007* Candles. Specification for fire safety
- *EN15494:2007* Candles - Product Safety Labels

7.4.4 Cookwares (Hardlines)

- *CMA* (Cookware Manufacturing Association standard)
- *EN12983 -1:2000* Cookware. Domestic cookware for use on top of a stove, cooker or hob. General requirements
- *BS EN ISO 8442-1:1998* Materials and articles in contact with foodstuffs. Cutlery and table holloware. Cutlery and table holloware. Requirements for cutlery for the preparation of food
- *EN13834:2007* Cookware. Ovenware for use in traditional domestic ovens

7.4.5 Furniture (Hardlines)

- *EN581-2:2009* Outdoor furniture. Seating and tables for camping, domestic and contract use. Mechanical safety requirements and test methods for seating
- *EN12520:2010* Furniture. Strength, durability and safety. Requirements for domestic seating
- *EN1022:2005* Domestic furniture. Seating. Determination of stability
- *EN581-3:2007* Outdoor furniture. Seating and tables for camping, domestic and contract use. Mechanical safety requirements and test methods for tables
- *EN12521:2009* Furniture. Strength, durability and safety. Requirements for domestic tables



- *EN14749:2005* Domestic and kitchen storage units and worktops. Safety requirements and test methods
- *ASTM F1427 - 07* Standard Consumer Safety Specification for Bunk Beds

7.5 Candidate applying certification in one sub-category shall only need to attend the courses designated for that particular sub-category.



8 MANAGEMENT SKILLS

8.1 Comprehensive Management (14 hours)

8.1.1 Manager's Basic Functions

8.1.2 Time Management

8.1.3 Communication in Your Workplace

8.1.4 Team Building – Basic understanding of concepts

8.1.5 Delegation and Management of Generation Y



9 LABORATORY MANAGEMENT AND SAFETY

9.1 Laboratory Management in compliance with ISO/IEC 17025 (Detailed Knowledge in the following aspects) (~15 hours)

- Document control
- Review of contract
- Subcontracting
- Verification of critical consumables
- Difference between correction and corrective actions and control of non-conforming work
- Preventive actions
- Technical records
- Environmental conditions
- Traceability (equipment)
- Sample identification and integrity within laboratory
- Quality assurance procedures and plan

9.1.1 The course is not suitable for candidates working in chemical or microbiological laboratories.

9.2 Safety (~6 hours)

9.2.1 Portable fire extinguishers and fire blankets - Selection and location AS 2444-2001

9.2.2 Safety in Laboratories AS/NZS 2243

- Part 6 : Mechanical aspects AS 2243.6
- Part 7 : Electrical aspects AS 2243.7
- Part 8 : Fume cupboards AS/NZS 2243.8
- Part 10 : Storage of chemicals AS/NZS 2243.10

9.2.3 **GUIDEBOOKS FROM LABOUR DEPARTMENT OF HKSAR**

- A brief guide to first aid
- A brief guide to the Occupational Safety and Health Ordinance
- A brief guide to the Occupational Safety and Health Regulation
- Code of practice on safety management
- Five steps to risk assessment



- Guidance notes on fire safety at workplaces
- Guidance notes on manual handling operations
- Guidance notes on ventilation and maintenance of ventilation systems
- Occupational health protection programme
- Safety at Work – A Guide to Personal Protective Equipment



10 MEASUREMENT UNCERTAINTY

10.1 Measurement uncertainty by ISO GUM (~21 hours)

- Approaches : ISO GUM
- Basic statistics such as ESDM, SD, normal distribution, U distribution, etc.
- Procedures in evaluation of measurement uncertainty
- Standard uncertainty
- Combined uncertainty
- Expanded uncertainty
- Sensitivity coefficient
- Effective Degree of freedom
- Reporting of uncertainty and compliance
- Examples and workshop covering textiles and garments, physical tests and electrical tests or specific tests in relation to disciplines of candidates engaged in.



11 PROFESSIONAL ETHICS

11.1 Ethics (~3 hours)

11.1.1 Prevention of Bribery Ordinance, Cap. 201

- Corruption
- Acceptance of Advantage

11.1.2 Confidentiality and proprietary right

11.1.3 Outside Employment

11.1.4 Use of Company Assets

11.1.5 Conflict of Interest

11.2 PCSTP01 “Regulations – Professional Certification Scheme of Testing Personnel”

- Code of ethics in general
- Code of ethics in relation to employer
- Code of ethics in relation to public
- Obligation of Certified Testing Personnel
- Use of Certification symbol and claim of certification status

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**Hong Kong Association for Testing, Inspection and
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