



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

**CC05
CERTIFICATION HANDBOOK
TEXTILES AND GARMENTS**

First Issue
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Secretariat
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FOREWORD

The Professional Certification Scheme for Testing Personnel (PCSTP) is a comprehensive scheme which provides for the examination and certification of individuals seeking to demonstrate their knowledge and/or competence in their field of operation.

The scheme is developed under HKTIC and managed by the Certification Board (CB), 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 sole criteria for certification of personnel engaged in textiles and garment testing are given in this document (and any subsequent amendments) and no other criteria will be applied. Certification is not conditional on the candidate applying for other services or membership from HKTIC or any other groups or associations.

The benefits of certification include:

1. recognition and prestige for the individual and creation of a competitive advantage over non-certified individuals in the same field;
2. enhanced employment opportunities;
3. establishment of a professional standard for individuals in a particular testing field;
4. assistance to employers in making more informed recruitment decisions;
5. a more productive and highly trained workforce for employers;
6. enhanced professional impression on customers;
7. assistance to clients in making informed decisions about qualified providers;
8. protection of the general public from using incompetent and unfit practitioners; and
9. assurance of the general public of the accuracy and validity of testing results.



Requirements of Certification of Personnel Engaged in Textiles and Garments Testing

1. General

- 1.1. This document prescribes procedures by which personnel may be examined and, if successful, certified for textiles and garments testing.

2. Scope of Certification

- 2.1. The levels of certification available are

- 2.1.1. Certified Testing Technician and;
- 2.1.2. Certified Testing Professional.

- 2.2. The scope of certification

Certification of textiles and garments testing is sub-divided into four sub-categories for Certified Testing Technician:

- 2.2.1. Color fastness and care performance tests;
- 2.2.2. Construction and physical performance tests;
- 2.2.3. Fibre analysis; and
- 2.2.4. Flammability safety.

3. Eligibility for certification

- 3.1. Candidates shall have a combination of education, training and experience adequate to ensure that they have the potential to understand the principles and procedures of the applicable methods.

- 3.2. Academic qualifications and experience

- 3.2.1. Certified Testing Technician (CTT)

- (a) The candidate shall have

- a diploma in Textile and Clothing or equivalent with no less than two years of relevant testing experience; or
- 10 years of relevant testing experience; or
- any other qualifications and experience deemed as equivalent.



3.2.2. Certified Testing Professional (CTP)

- (a) The candidate shall have a bachelor's degree in Textile and Clothing or equivalent and with no less than three years of relevant experience.
- (b) Candidate without a degree shall
 - have been certified as Certified Testing Technician by the Certification Board and have no less than five years of relevant supervisory experience post certification as CTT, or
 - have no less than 15 years of relevant experience of which 5 years shall be at a managerial position.
- (c) Candidates shall have any other qualifications and experience deemed as equivalent.

3.3. Training

3.3.1. Certified Testing Technician shall

- (a) provide certificates of achievement (satisfactory results in end-of-course evaluation) in training courses approved by the Certification Board in the respective competence requirements; or
- (b) obtain satisfactory results in certification examinations as arranged by the Certification Board.

Details of approved training courses are available on www.hktic.org.

3.3.2. Certified Testing Professional shall

- (a) any one of the following:
 - (i) provide certificates of achievement (satisfactory results in end-of-course evaluation) in training courses approved by the Certification Board in respective competence requirements; or
 - (ii) obtain satisfactory results in certification scheme examinations as arranged by the Certification Board; or
 - (iii) have no less than 15 years of relevant experience, of which 5 years shall be at managerial position; or



- (iv) HOKLAS approved signatory with not less than 8 years of relevant experience and the scope of signatory approval covering the major measurement techniques or methods as stipulated in this Certification Handbook for the sub-category the certification is being sought; and

- (b) obtain satisfactory results in professional assessment by interview.

Details of approved training courses are available on www.hktic.org.

3.4. Competence requirements for Certified Testing Technician

3.4.1. General requirements

- Understanding of ISO/IEC 17025
- Laboratory safety
- Integrity management

3.4.2. Technical requirements

- Understanding basic laboratory techniques
- Knowledge of equipment usage

3.5. Competence requirements for Certified Testing Professional

3.5.1. Management requirements

- Management skills
- Integrity management

3.5.2. Quality requirements

- Laboratory management in compliance with ISO/IEC 17025 including
 - Statistical treatments of data and quality control requirement
- Laboratory safety

3.5.3. Technical requirements

- Estimation of measurement uncertainty
- Interpretation of results and reporting requirements
- Requirements of equipment calibration
- Principles of laboratory techniques employed in testing



4. Examination Procedure

4.1. A candidate who can provide certificates of achievement in training courses in all competence requirements may be exempted from examinations.

4.2. Partial exemption for examinations is not allowed.

4.3. No exemption is permitted for professional assessment by interview for Certified Testing Professional candidates.

4.4. Examinations consists of

4.4.1. Written examination; and/or

4.4.2. Professional assessment by interview (for Certified testing Professionals only).

4.5. Candidates must satisfy the examiner(s) in all parts. Details of the examination format follow the syllabus and specimen examination questions as given in Appendices 1 and 2 respectively.

4.6. Types of questions

4.6.1. Multiple choice questions

4.6.2. Short answer questions

4.6.3. Open-ended questions

4.7. Examination for Certified Testing Technician

The examination will comprise the following:

4.7.1. General

- multiple-choice questions
- short answer questions

4.7.2. Technical

- multiple-choice questions
- short answer questions

4.7.3. Time length of examination

- Written examination – 2 hours



4.7.4. Weighting of each topic

<u>Topics</u>	<u>Weighting (%)</u>
a) Understanding ISO/IEC 17025	10
b) Laboratory safety	10
c) Integrity management	10
d) Understanding basic laboratory techniques	45
e) Equipment usage	25

Weighing of each topic shall not deviate from the pre-set percentage by more than 5%.

4.7.5. Marking system

- Model answer shall be set for each multiple choice questions. Marks will be given for correct answers and half of the mark will be deducted for each wrong answer.
- Suggested answers shall be set and marks should be allocated according to key points of answers for short questions. Marks for each key point should be pre-set. Marks would be given to answers with meanings which match the suggested answers as judged by the marker.

4.7.6. Passing mark

- The passing mark for each section shall not be less than 40% and the overall passing mark is 60%.

4.8. Examination for Certified Testing Professional

The examination will comprise the following:

4.8.1. Management requirements

- Multiple choice questions
- Short answer questions
- Open-ended question(s)

4.8.2. Quality requirements

- Multiple choice questions
- Short answer questions



- Open-ended question(s)

4.8.3. Technical requirements

- Multiple choice questions
- Short questions
- Open-ended question(s)

4.8.4. Professional assessment by interview

- The interview will cover all certification criteria and focus on underlying principles, limitations, quality control checks and reporting requirements of tests currently undertaken by the candidate.

4.8.5. Time length of examinations

- Written examination – 3 hours
- Professional assessment by interview – 30 to 50 minutes

4.8.6. Weighting for each topic

<u>Topics</u>	<u>Weighting (%)</u>
a) Management requirements	10
b) Integrity management	10
c) Laboratory management in compliance with ISO/IEC 17025	15
d) Laboratory safety	5
e) Estimation of measurement uncertainty	10
f) Interpretation of results and reporting requirements	10
g) Requirements of equipment calibration	15
h) Principles of measurement methods	25

Weighting of each topic shall not deviate from the pre-set percentage by more than 5%.

4.8.7. Marking system

- The same marking system as Section 4.7.5 shall apply. The marking system for open-ended questions shall be the same as that for short questions.



4.8.8. Passing Mark

- The passing mark is 60% for each of the written examination and of the interview.
- A candidate must pass both the written examination and the interview.



5. Application Procedure for Certification/Examination and Fees

5.1. Application form

5.1.1. Applications must be made on the appropriate application form which is available at www.hktic.org.

5.1.2. Application form asks for specific details of experience and training and must be signed confirming that these details are correct and supported by such other documents as may be necessary to confirm that the candidate is eligible for examination.

5.1.3. No applications can be confirmed or examination dates issued until receipt of a correctly completed application form and the full fees. In the event of false statements being discovered any certificate awarded as a result of the test will be revoked and declared null and void.

5.2. Application and examination fees

5.2.1. The fee structure is as follows:

Level	Type of application/examination	Fee (H.K. \$)
CTT	Initial and upgrade application	300
	Examination (written), if applicable ^{Note}	500
	Annual subscription fee	500
CTP	Initial and upgrade application	500
	Examination (written), if applicable ^{Note}	500
	Examination (professional assessment)	1000
	Annual subscription fee	500

Note:

Written examination can be exempted under the following conditions by:

- achieving certificate of achievement (satisfactory results in end-of-course evaluation) in approved training courses for all competence requirements; or
- fulfilling the academic requirements and having no less than 15 years of relevant experience, of which 5 years shall be at a managerial position for testing professionals.



5.3. Initial certification, certification upgrade and extension of certification of new category

- 5.3.1. Candidates who are seeking certification for the first time or for those wishing to upgrade or extend their certification credential can go to website www.hktic.org and download an application form and Handbook for the test category to be certified.
- 5.3.2. The candidate shall submit payment, completed application form and documentation consisting of :
- Academic qualifications;
 - Certificate of achievements in appropriate training courses; and
 - Any other relevant records
- 5.3.3. The application is reviewed and evaluated by the Programme Officer for confirmation of acceptance at the requested level of certification. The candidate is notified of the decision and/or date and time of examination where applicable.
- 5.3.4. The Certification Board may grant certification to Testing Technicians directly without examination on condition that they fulfill the academic and training criteria as stipulated in clauses 3.2.1 and 3.3.1.
- 5.3.5. The Certification Board may recommend that a candidate seeks certification at an alternate level, or terminate the certification process after reviewing the documents submitted. The application fee would not be refunded.
- 5.3.6. The examiners involved are independent and do not respond to questions from candidate. The Programme Officer provides the information about the certification process to the candidate and answers any questions he/she may have.
- 5.3.7. The Certification Board makes the decisions on awarding a pass or fail based primarily upon the recommendation of the examiners.
- 5.3.8. A candidate applying for Certified Testing Professional is advised to take and pass the written examination before applying for professional assessment by interview.
- 5.3.9. All certified personnel will be registered in databases and presented as public information on their respective websites. The candidate is notified of the result of the



certification procedure within 30 calendar days after the examination or submission of application. They are entitled to use the designation as CTP or CTT.

5.4. Re-certification

5.4.1. Candidates are required to re-certify after the period of certification validity, which is normally 3 years from the date of issue of the certificate, has expired.

5.4.2. The re-certification process is different from the first certification process. It concentrates on the continuing professional development (CPD) of the individual that has taken part in since the last certification or re-certification. Similar to first certification, candidate shall visit the website and download the application form and shall submit payment and completed documentation, consisting of

- Application form for re-certification
- Working experience in the past 3 years and
- Records of Continuing Professional Development (form for recording of CPDU is available on website www.hktic.org)

5.4.3. The Programme Secretariat will review the records of CPD to determine whether the re-certification candidate fulfils the CPD requirements for his/her level.

5.5. Continuing Professional Development (CPD)

5.5.1. The Continuing Professional Development programme supports the ongoing educational and professional development of individuals who have attained the certification. The purpose of the CPD program is to:

- enhance ongoing professional development;
- encourage and recognize individualized learning opportunities;
- maintain the value and recognition of the certification; and
- provide a vehicle for attaining and recording professional development activities.

5.5.2. In order to satisfy the CPD programme and maintain an active certification status, candidate must accrue and report a minimum of 30 and 60 Continuing Professional Development Units (CPDUs) during each three-year certification cycle for Certified Testing Technician and Certified Testing Professional respectively. A Certified Testing Technician can accrue the necessary CPDUs by participating in any one or more activities as listed in Appendix 4. A Certified Testing Professional shall



participate in at least two activities. The number of CPDUs accrued for one activity shall not be less than 30 in case the Professional attends only two activities. The expiry date of validity is shown on the certificate.

5.5.3. Continuing Professional Development Units (CPDUs)

- The Continuing Professional Development Units (CPDUs) is the measuring unit used to quantify approved learning and professional service activities. Typically, one CPDU is earned for every one hour spent in a planned, structured learning experience or activity. There is a range of opportunities available to candidates to acquire CPDUs through training/education programmes and professional activities covering seminar, industrial discussion group, symposium, training course, etc. Appendix 4 gives guidelines for counting CPDUs.

5.6. Cancellations, Rescheduling, No Shows

- 5.6.1. If candidate needs to cancel or reschedule an interview or an examination, he/she must do so no later than 48 hours before the scheduled appointment.
- 5.6.2. If he/she fails to notify the appropriate party within the specified time period and/or fails to meet a scheduled examination appointment, he/she forfeits the full certification fee and will have to pay the full certification fee in order to schedule another interview or examination.
- 5.6.3. There are times when extenuating circumstances (e.g. medical emergency, death in immediate family, illness in immediate family) may prevent a candidate from meeting a scheduled interview or examination appointment, resulting in a no show. Should such a situation arise, the candidate will be asked to provide explanations along with supporting documentation (e.g. accident report, medical documentation, death certificate). If he/she does not make contact within 72 hours following a missed appointment, fees will apply in order to schedule a new appointment. All claims will be reviewed on a case-by-case basis. The candidate is allowed a maximum of one year, from the date of application is approved, to apply for re-examination.



6. Appeals

6.1. As a policy, the Certification Board has a procedure for considering appeals against the decisions at the end of each stage of the certification cycle.

6.2. Written examination recheck

6.2.1. The marks awarded for a particular section may be subject to a recheck. A recheck is carried out to ensure that there have been no arithmetical or clerical errors, that the marks awarded are appropriate and that all the marks to which the candidate is entitled have been included in the final total.

6.3. Professional assessment Review

6.3.1. The grounds for such review must clearly identify the element or elements of the assessment for which the review is sought. It must also specify the grounds on which the review is sought and must contain all information, which the candidate requests to be taken into account in the review.

6.3.2. The grounds for a review are:

- The regulations have not been properly implemented.
- The regulations do not adequately cover the candidate's case.
- Compassionate or medical circumstances related to the candidate's assessment situation, which were made known by the candidate in writing.
- Significant performance related information which the candidate believes was not considered by the examiners.

6.4. Appeal for a written examination recheck

6.4.1. A request for a recheck must be received no later than 10 working days after the date of posting of the examination results.

6.4.2. Only a written request for a recheck will be considered.

6.4.3. A fee, as stipulated in the Schedule of Fees, will be charged, which must be included in the request for a recheck. Such fee is non-refundable.

6.5. Appeal for a professional assessment review

6.5.1. A request for a review must be received no later than 10 working days after the date of posting of the assessment results.



- 6.5.2. Only a written request will be considered.
- 6.5.3. As the result of the appeal needs to be ratified by the Certification Board, it may take some time before the candidate is notified of the decision.
- 6.5.4. The fee for the professional assessment review is as set forth in the Schedule of Fees. Such fee is non-refundable.
- 6.6. An appeal form for appeal of written examination and professional assessment is available on website www.hktic.org.



7. Obligations

7.1. All certified personnel shall at all times:-

7.1.1. commit to abide with the Regulations as set for the PCSTP scheme;

7.1.2. pay the fees and charges as determined by the Certification Board;

7.1.3. represent honestly and truthfully to any person concerned that he/she is only certified for activities stated in the scope of certification;

7.1.4. endeavour to ensure that the certification granted by the Certification Board is not used in a misleading manner; and

7.1.5. maintain complete integrity and impartiality in all circumstances.

7.2. Details of regulations are given in the document PCSTP01 “Regulations for Professional Certification Scheme for Testing Personnel”.



APPENDIX 1:

Examination Syllabus and specimen questions for Certified Testing Technician

Any aspect of the syllabus may be included in the written examinations or professional assessments. The level of knowledge required by the candidates varies according to the topic. To ensure comprehension by all parties, the following terms have been selected to demonstrate an increasing level of knowledge.

Definitions

Outline Knowledge: The candidate must be familiar with the subject in outline terms. He/She should know that the topic exists and what it is applied to. In the context of methods/techniques the candidate would be expected to know "what it is, what it does" but would not be expected to know the finer points of application of the technique.

Knowledge: The candidate must have a working knowledge of the subject and be able to apply it.

Detailed Knowledge: The candidate must have a depth of knowledge sufficient to enable him/her to exercise judgment.

Types of questions

For all multiple-choice questions candidates are required to tick or otherwise indicate the correct answer in the space provided.

Candidates are expected to give a few words, a phrase or a sentence as answers for short answer questions in the space provided.

Candidates are required to explain in depth for open-ended questions.

1. Examination syllabus of Certified Testing Technician

1.1. General requirements (outline knowledge)

1.1.1. Understanding of ISO/IEC 17025

- 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 care performance and color fastness tests
 - concept of laboratory control sample
 - replicate analysis

1.1.2. Laboratory safety (knowledge)

- General laboratory safety
- Health and safety
- Personal protection for handling samples and equipment
- Precautions in performing flammability tests
- Measures in using large and heavy equipment in the laboratory

1.1.3. Integrity management (detailed knowledge)

- Prevention of Bribery Ordinance, Cap. 201
 - Corruption
 - Advantages
- Confidentiality and proprietary right
- Outside Employment
- Use of Company Assets
- Conflict of Interest
- 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

1.2. Technical requirements (knowledge)

1.2.1. Understanding on basic laboratory technique, related precautions and limitations

- Understanding of terms used for textiles and garments
- Specimen preparation
- Sample conditioning requirements



- Knowledge of one sub-category as defined in Appendix 5

1.2.2. Equipment usage (knowledge)

- 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
- Use of equipment for one sub-category as defined in Appendix 6

2. Specimen examination Questions

2.1. Name a type of fibre that is soluble in m-cresol .

2.2. Which kind of fabric is NOT suitable for tensile strength test (ASTM D5034)?

2.3. What pieces of information should be given in a calibration label?

2.4. A garment manufacturer just purchased 85% Polyamide/ 15 % Lycra ® (Licensed from Invista) fabric for a swimwear production. What CORRECT instruction they need to provide to a label manufacturer for label production when the goods are imported to US?

- A. 85% Nylon / 15% Lycra ® Spandex
- B. 85% Nylon / 15% Spandex Lycra ®
- C. 85% Polyamide / 15% Elastane Lycra ®
- D. 85% Nylon/ 15% Lycra ®
- E. 85% Polyamide / 15% Lycra ® Elastic



APPENDIX 2:

Examination syllabus and specimen questions for Certified Testing Professional

1. Competence requirements of Certified Testing Professional

1.1. Management requirements (Detailed Knowledge)

- 1.1.1. Manager's Basic Functions
- 1.1.2. Time Management
- 1.1.3. Communication in Your Workplace
- 1.1.4. Team Building – Basic understanding of concepts
- 1.1.5. Delegation and Management of Generation Y

1.2. Quality requirements

1.2.1. Laboratory management in compliance with ISO/IEC 17025 (Detailed Knowledge in the following aspects)

- Document control
- Review of contract
- Subcontracting
- Verification of critical consumables
 - Reagent water
 - chlorine content of hypochlorite
 - size and mass to area ratio of dummy loading fabrics
 - dimensions and friction of liner for pilling tests
- Difference between correction and corrective actions and control of non-conforming work
- Preventive actions
- Technical records – test result, verification records, etc.
- Environmental and sample conditioning requirement
- Traceability (acceptable control for visual assessment)
- Traceability (equipment)
- Sub-sampling requirements
- Sample identification and integrity within the laboratory
- Quality assurance procedures and plan
 - control for care performance and color fastness tests
 - identification of suitable laboratory control sample
 - Method verification
 - Minimum method verification such as precision criterion for different



textiles and garments encountered

- Participation in proficiency testing programme
- Continuing competence
- Statistical treatments of data and quality control requirement (detailed knowledge)
 - Basic statistics such as student-t test, Q test, normal distribution and standard deviation

1.2.2. Laboratory safety (detailed knowledge)

- General laboratory safety
- Health and safety
- Personal protection for handling samples and equipment
- Precautions in performing flammability tests
- Measures in using large and heavy equipment in the laboratory

2.4.1. Integrity management (detailed knowledge)

- Prevention of Bribery Ordinance, Cap. 201
 - Corruption
 - Advantages
- Confidentiality and proprietary right
- Outside Employment
- Use of Company Assets
- Conflict of Interest
- 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

1.3. Technical requirements (knowledge)

1.3.1. Estimation of measurement uncertainty

- Approaches for estimation of measurement uncertainty e.g. ISO GUM, EURACHEM
- Factors affecting measurement uncertainty
- Reporting of uncertainty and compliance
- Verification system of color fastness and care performance tests and uncertainty in relation to such tests



1.3.2. Interpretation of results and reporting requirements (detailed knowledge)

- Repeatability
- Number of significant figures
- Reporting format as stated in test standard
- Deviations from test standards

1.3.3. Requirements of the following equipment calibration:

- Length measurement devices
- Temperature and humidity measuring devices
- Equipment of any two sub-categories as specified in Appendix 6

1.3.4. Basic laboratory techniques and principles

(a) General

- Importance of sample conditioning
- How water regain affect the result
- Terms used for textiles and garments
- How the construction of fabric affecting the results
- Types of dyes and ease of fastness of different color dyes (knowledge)
- Types of fabric commonly used for different garments and their properties

- (b) Candidate should demonstrate detailed knowledge of principles, limitations and requirements of any two of the sub-categories as given Appendix 5.

Professional assessment syllabus on sector specific tests (only for testing professional)

1. Principles of test procedures and measurement techniques

1.1 Scope and limitation of the test

1.2 Critical parameters to be monitored

1.3 Quality control and replicate analysis

2 Requirements of standards

2.1 Reporting requirements

2.2 Conditioning requirements

2.3 Sample size and sample preparation



2. Specimen examination questions

- 2.1. Define correction, corrective and preventive actions. Illustrate the difference with an example.
- 2.2. Explain the principles of operation of a tensile tester. List the factors that would affect the results.
- 2.3. Is there any difference between the light source for color fastness to light testing to AATCC or EN standard?
- 2.4. Suppose a measurement result is y , the combined standard uncertainty of y is $u_c(y)$, and the coverage factor is k , then the expanded uncertainty U is:
 - A. $k \times u_c(y)$
 - B. $2k \times u_c(y)$
 - C. $3k \times u_c(y)$
 - D. $u_c(y) \div k$
 - E. None of the above
- 2.5. Professional assessment by interview
 - State the approaches and related principles of fibre analysis. Briefly describe the procedures.

**APPENDIX 3****Training courses approved by the Certification Board**

Before 1 January 2012, candidate attending the courses as listed below is deemed to satisfy the competence requirements shown.

1. Certified Testing Technician

Competence requirements	Course Name	Training Provider
ISO/IEC 17025	Laboratory Management	HKAS/HKTIC/IVE
Laboratory Safety	Laboratory Safety	HKTIC/VTC/OSHC/Labour Department

2. Certified Testing Professional

Competence requirements	Course Name	Training Provider
ISO/IEC 17025	Laboratory Management	HKAS/HKTIC/IVE
Laboratory Safety	Laboratory Safety	HKTIC/VTC/ OSHC/Labour Department
Measurement uncertainty	Guide to Expression of Uncertainty of Measurement	HKAS/HKTIC

HKTIC – Hong Kong testing, Inspection and Certification Limited

HKAS – Hong Kong Accreditation Services

VTC – Vocational training Council

IVE – Hong Kong Institute of Vocation Education

OSHC - Occupational Safety and Health Council



As commence from 1 January 2012, candidate is required to obtain certificates of achievement (satisfactory results in end-of-course evaluation) in the following approved courses in meeting the competence criteria. Lists of training organizations and training courses are available on the Scheme website www.hktic.org.

1. Certified Testing Technician (both quality and technical requirements)

Competence requirements	Course Name	Duration (hours)
Quality requirement	Understanding ISO/IEC 17025 and laboratory safety	9 hours
Technical requirements	Basic laboratory technique and use of equipment	24 hours
Integrity requirements	Ethics	3 hours

1. Certified Testing Professional

Competence requirements	Course Name	Duration (hours)
Management skills	Comprehensive management	14
ISO/IEC 17025 Statistical treatment of data and quality control requirement	Laboratory management	15
Safety	Laboratory safety	6
Measurement uncertainty	ISO GUM	21
Basic techniques and use of equipment	Principles of laboratory techniques and calibration/performance check requirements for textiles and garments tests	40



APPENDIX 4

Guidelines for counting Continuing Professional Development Unit (CPDU)

Activities	CPDUs
Training course, seminar or workshop on relevant topics (Internal training and workshops on relevant topics are also counted ^{Note1})	1 CPDU for candidate attending workshops or seminars which involve each contact hour.
Author or co-author of an article published in a refereed journal	30 CPDUs per article (author) 20 CPDUs per article (co-author)
Author or co-author of an article published in a non-refereed journal	15 CPDUs per article (author) 10 CPDUs per article (co-author)
Lecturer/Speaker on relevant topics at a conference, seminar or formal course.	10 CPDUs per activity
Member or moderator on relevant topics at a conference, symposium, workshop or formal course.	5 CPDUs per activity
Author or co-author of textbook on relevant field	40 CPDUs (author) 20 CPDUs (co-author)
Developer of content for a testing learning courseware.	10 CPDUs per new course
Board or committee member of testing or certification organization	20 CPDUs (board)per annum 10 CPDUs (committee) per annum
Development of new international/regional test standard	30 CPDUs
Verification and implementation of new international/regional test standard ^{Note2}	10CPDUs
Development of new accredited in-house method (limited to 3 developers) ^{Note3}	15 CPDUs
Technical visit	1 CPDU per each visit hour



Remarks:

- Note 1: Internal training should be organized in similar structure as external training with training materials, assessment and attendance or assessment certificate.
- Note 2: Organization should maintain evidence in support of competence in performing the tests including documentation (test procedures), satisfactory results in proficiency testing activities (proficiency testing programme, interlaboratory comparison programmes or verification by certified matrix reference materials).
- Note 3: Accreditation should be granted by HKAS (Hong Kong Accreditation Services) or accreditation body having MRA (mutual recognition agreement) with HKAS.



APPENDIX 5

Sub-categories of textiles and garments testing

1. Color fastness and care performance tests

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

- 1.1 Colour Fastness Assessment, e.g. Light, Washing, Dry-cleaning, Hot Pressing, Perspiration, Water, etc.
- 1.2 Controls used for different visual tests
- 1.3 Care Performance Tests, e.g. Dimensional Stability to and Appearance after Washing
- 1.4 Assessment methods and related requirements of assessment room or chamber
- 1.5 Recording of results

2 Construction and performance Tests

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

- 2.1 Construction Tests for Fabric, e.g. Fabric Weight, Density, Yarn Size
- 2.2 Strength and Durability Tests, e.g. Tensile, Tear, Abrasion Resistance
- 2.3 Performance Tests required Visual Grading, e.g. Pilling Resistance, Snagging Resistance, etc.
- 2.4 Other Performance Tests, e.g. Air permeability, Water Repellency and Resistance, etc.
- 2.5 Knowledge on the above tests and factors affecting the results
- 2.6 Number of determinations required

3 Fibre analysis

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

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



4 Flammability safety

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

- 4.1 Flammability Tests for Textile and Garments
- 4.2 Flammability Tests for Carpet and rug
- 4.3 Pre-conditioning requirements and requirements of testing chamber
- 4.4 Number of determinations and pre-treatment such as drycleaning for different test standard



APPENDIX 6

List of equipment required for each sub-category

1. Color fastness and care performance tests
 - 1.1 Crockmeter
 - 1.2 Drycleaning Cylinder
 - 1.3 Fade-o-meter
 - 1.4 Perspiration Tester
 - 1.5 Wascator
 - 1.6 Washer
 - 1.7 Wira Steam Cylinder
- 2 Construction and Physical Performance Tests
 - 2.1 Abrasion Tester (Inflated Diaphragm)
 - 2.2 Abrasion Tester (Martindale)
 - 2.3 Bursting Tester
 - 2.4 Elmendorf Tearing Tester
 - 2.5 Rain tester
 - 2.6 Spray tester
 - 2.7 ICI Pilling Box
 - 2.8 Random Tumbler
 - 2.9 Tensile tester
 - 2.10 Temperature and humidity monitoring device
- 3 Fibre analysis
 - 3.1 Microscope
 - 3.2 Balance
 - 3.3 FTIR
- 4 Flammability Safety
 - 4.1 Flammability Tester (CFR1610)
 - 4.2 Flammability Tester (CFR1615)



APPENDIX 7

References

1. *ISO/IEC 17025:2005* "General requirements for the competence of testing and calibration laboratories"
2. *HKTIC PCSTP01* "Regulations for Professional Certification Scheme for Personnel"
3. *ISO 5725-3: 1994* Accuracy (trueness and precision) of measurement methods and results Part 3 – Intermediate measure of the precision of a standard measurement method
4. Standards in relation to measurement uncertainty
 - 4.1. *EURACHEM/CITAC Guide:2000* Quantifying Uncertainty in Analytical measurements
 - 4.2. *ISO/IEC Guide 98-3:2008* Uncertainty of measurement -- Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)
5. *HOKLAS Supplementary Criteria No. 22* Textiles and Garments Test Category
6. *GUIDEBOOKS FROM LABOUR DEPARTMENT OF HKSAR*
 - 6.1. A brief guide to first aid
 - 6.2. A brief guide to the Occupational Safety and Health Ordinance
 - 6.3. A brief guide to the Occupational Safety and Health Regulation
 - 6.4. Code of practice on safety management
 - 6.5. Guidelines for good occupational hygiene practice in a workplace
 - 6.6. Hazards during chemicals in use and safety guidelines
7. *Standards in relation to laboratory safety*
 - 7.1. *BS 7258* Laboratory fume cupboards
 - 7.2. *AS 2444* Portable fire extinguishers and fire blankets - Selection and location
 - 7.3. *AS/NZS 2243.8* Fume cupboards
 - 7.4. *AS/NZS 2243.10* Storage of chemicals



8. *Standards in relation to color fastness and care performance tests*

- 8.1. AATCC 107-2009 Colorfastness to Water
- 8.2. AATCC 132-2009 Colorfastness to Drycleaning
- 8.3. AATCC 133-2009 Colorfastness to Heat: Hot Pressing
- 8.4. AATCC 135-2010 Dimensional Changes of Fabrics after Home Laundering
- 8.5. AATCC 143-2010 Appearance of Apparel and Other Textile End Products after Repeated Home Laundering
- 8.6. AATCC 150-2010 Dimensional Changes of Garments after Home Laundering
- 8.7. AATCC 15-2009 Colorfastness to Perspiration
- 8.8. AATCC 16-2004 Colorfastness to Light
- 8.9. AATCC 162-2009 Colorfastness to Water: Chlorinated Pool
- 8.10. AATCC 61-2010 Colorfastness to Laundering: Accelerated
- 8.11. AATCC Evaluation Procedure 10-2007 Multifiber Adjacent Fabrics: Evaluation of Multifiber Adjacent Fabrics
- 8.12. AATCC Evaluation Procedure 9-2010 Visual Assessment of Color Differences of Textiles
- 8.13. ISO 105-B02:1994/Amd 1:1998/ Amd 2:2000 Colour fastness to artificial light: Xenon arc fading lamp test
- 8.14. ISO 105-C06:2010 Colour fastness to domestic and commercial laundering
- 8.15. ISO 105-D01:2010 Colour fastness to drycleaning using perchloroethylene solvent
- 8.16. ISO 105-E01:2010 Colour fastness to water
- 8.17. ISO 105-E04:2008 Colour fastness to perspiration
- 8.18. ISO 105-X11:1994 Textiles - tests for colour fastness - Part X11: Colour fastness to hot pressing
- 8.19. ISO 3005:1978 Textiles - Determination of dimensional change of fabrics induced by free-steam
- 8.20. ISO 3759-2007 Textiles - Preparation, marking and measuring of fabric specimens and garments in tests for determination of dimensional change
- 8.21. ISO 5077-2007 Textiles - Determination of dimensional changes in washing and drying
- 8.22. ISO 6330-2000/Amd.1:2008 Textiles - Domestic washing and drying procedures for textile testing

9. *Standards in relation to construction and physical performance tests*

- 9.1. AATCC 22-2005 Water Repellency: Spray Test
- 9.2. AATCC 35-2006 Water Resistance: Rain Test
- 9.3. ASTM D1059-2001 Standard Test Method for Yarn Number Based on Short-Length



Specimens

- 9.4. *ASTM D1424-09* Standard Test Method for Tearing Strength of Fabrics by Falling Pendulum Type (Elmendorf) Apparatus
- 9.5. *ASTM D3512 / D3512M - 10e2* Standard Test Method for Pilling Resistance and Other Related Surface Changes of Textiles Fabrics: Random Tumble Pilling Test
- 9.6. *ASTM D3775-2008* Standard Test Method for Warp (End) and Filling (Pick) Count of Woven Fabrics
- 9.7. *ASTM D3776-2007* Standard Test Methods for Mass Per Unit Area (Weight) of Fabrics
- 9.8. *ASTM D3786 / D3786M - 09* Standard Test Method for Bursting Strength of Textile Fabrics - Diaphragm Bursting Strength Tester Method
- 9.9. *ASTM D3886-1999(2007)* Standard Test Method for Abrasion Resistance of Textile Fabrics (Inflated Diaphragm Apparatus)
- 9.10. *ASTM D3887-1996(2008)* Standard Specification for Tolerances for Knitted Fabrics
- 9.11. *ASTM D3939 / D3939M - 11* Standard Test Method for Snagging Resistance of Fabrics (Mace)
- 9.12. *ASTM D4966-1998(2007)* Standard Test Method for Abrasion Resistance of Textile Fabrics (Martindale Abrasion Tester Method)
- 9.13. *ASTM D5034-09* Standard Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test)
- 9.14. *ASTM D5035-11* Standard Test Method for Breaking Force and Elongation of Textile Fabrics (Strip Method)
- 9.15. *ASTM D737-2004* Standard Test Method for Air Permeability of Textile Fabrics
- 9.16. *ISO 12945-1:2000* Textiles - Determination of fabric propensity to surface fuzzing and to pilling - Part: Pilling Box method
- 9.17. *ISO 12947-2: 1998* Determination of the Abrasion Resistance of Fabric by the Martindale method - Part 2: Determination of specimen breakdown
- 9.18. *ISO 13934-1:1999* Textiles properties of fabrics - Part 1: Determination of maximum force and elongation at maximum using the strip method
- 9.19. *ISO 13934-2:1999* Textiles - Tensile properties of fabrics - Part 2: Determination of maximum force using the grab method
- 9.20. *ISO 13937-1:2000* Textiles - Tear properties of fabrics - Part 1: Determination of tear force using ballistic pendulum method
- 9.21. *ISO 13938-1:1999* Textiles -- Bursting properties of fabrics -- Part 1: Hydraulic method for determination of bursting strength and bursting distension
- 9.22. *ISO 22958-2005* Textiles -- Water resistance -- Rain tests: exposure to a horizontal water spray
- 9.23. *ISO 3801-1977* Textiles -- Woven fabrics -- Determination of mass per unit length and



mass per unit area

- 9.24. *ISO 4920-1981* Textiles -- Determination of resistance to surface wetting (spray test) of fabric
- 9.25. *ISO 7211/5-1984* Textiles -- Woven fabrics -- Construction -- Methods of analysis -- Part 5: Determination of linear density of yarn removed from fabrics
- 9.26. *ISO 9237-1995* Textiles -- Determination of the permeability of fabrics to air

10. *Standards in relation to fibre analysis*

- 10.1. *AATCC 20-2010* Fiber Analysis: Qualitative
- 10.2. *AATCC 20A-2010* Fiber Analysis: Quantitative
- 10.3. *ASTM 1909-04* Table of Commercial Moisture Regains for Textile Fibers

11. *Standards in relation to flammability safety*

- 11.1. *16 CFR Part 1610* Standard for the Flammability of Clothing Textiles
- 11.2. *16 CFR Part 1615* Standard for the Flammability of Children's Sleepwear: Sizes 0 through 6X (FF 3-71)
- 11.3. *16 CFR Part 1616* Standard for the Flammability of Children's Sleepwear: Sizes 7 through 14 (FF 5-74)
- 11.4. *16 CFR Part 1630* Standard for the Surface Flammability of Carpets and Rugs (FF 1-70)
- 11.5. *16 CFR Part 1631* Standard for the Surface Flammability of Small Carpets and Rugs (FF 2-70)
- 11.6. *ASTM D1230-10* Standard Test Method for Flammability of Apparel Textiles



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