





SEMINAR ON TESTING AND CERTIFICATION FOR FIRE SAFETY IN BUILDINGS

PRODUCT CONFORMITY CERTIFICATION SCHEME FOR PASSIVE FIRE PROTECTION PRODUCTS

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WHAT IS PRODUCT CERTIFICATION SCHEME?

- The aim is to ensure that the products are manufactured according to the claimed manufacturing procedure, use of correct raw materials with continuous monitoring by a third party Certification Body and satisfy the specified requirements
- The factory shall implement ISO 9001 management system or equivalent in administrative as well as manufacturing
- The product used for type testing will be selected by third party to ensure that the product is not specially 'made' for testing
- The basic elements of Product Certification are given in the ISO/IEC 17067

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ISO/IEC 17067

4 Product certification

4.1 Concept of product certification

4.1.1 Product certification is the provision of assessment and impartial third-party attestation that fulfilment of specified requirements has been demonstrated. Product certification is carried out by product certification bodies which should conform to ISO/IEC 17065. Specified requirements for products are generally contained in standards or other normative documents.

4.1.2 Product certification is an established conformity assessment activity that <u>provides confidence</u> to consumers, regulators, industry and other interested parties that products <u>conform to specified</u> requirements, including for example product performance, safety, interoperability and sustainability.

4.1.3 Product certification can facilitate trade, market access, fair competition and consumer acceptance of products on a national, regional and international level.

4.2 Objectives of product certification

- 4.2.1 The fundamental objectives of product certification are:
- a) to address the needs of consumers, users and, more generally, all interested parties by giving confidence regarding fulfilment of specified requirements;
- b) to allow suppliers to demonstrate to the market that their product has been attested to fulfil specified requirements by an impartial third party body.

right International Organization for Standardizatio

- **4.2.2** Product certification should provide the following:
- confidence for those with an interest in fulfilment of requirements, and
- sufficient value so that suppliers can effectively market products.



Conformity assessment — Fundamentals of product certification and guidelines for product certification schemes

Évaluation de la conformité — Éléments fondamentaux de la certification de produits et lignes directrices pour les programmes de certification de produits

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Reference number

ISO/IEC 17067:2013(E)

ISO/IEC 17067

- Depends on the product type, the certification may be carried out according to different certification scheme type
- Type 5 is the highest level requires more in the surveillance

	Conformity assessment functions and activities ^a	Туре	Types of product certification s			n sch	emes ^b		
	within product certification schemes	1 a	1b	2	3	4	5	6	Nc,d
Ι	Selection, including planning and preparation activities, specification of requirements, e.g. normative documents, and sampling, as applicable	х	х	х	х	х	х	х	х
II	Determination of characteristics, as applicable, by:	х	х	х	х	х	х	х	х
	a) testing								
	b) inspection								
	c) design appraisal								
	d) assessment of services or processes								
	e) other determination activities, e.g. verification								
III	Review	х	х	х	х	x	x	x	x
	Examining the evidence of conformity obtained during the determina- tion stage to establish whether the specified requirements have been met								
IV	Decision on certification	х	х	х	х	х	х	х	х
	Granting, maintaining, extending, reducing, suspending, withdrawing certification								
V	Attestation, licensing								
	a) issuing a certificate of conformity or other statement of conformity (attestation)	x	х	x	х	x	x	x	x
	b) granting the right to use certificates or other statements of conform- ity	x	x	x	x	x	x	x	
	c) issuing a certificate of conformity for a batch of products		х						
	d) granting the right to use marks of conformity (licensing) is based on surveillance (VI) or certification of a batch.		x	x	х	x	х	x	
VI	Surveillance, as applicable (see <u>5.3.4</u> to <u>5.3.8</u>), by:								
	a) testing or inspection of samples from the open market			x		x	x		
	b) testing or inspection of samples from the factory				х	х	х		
	c) assessment of the production, the delivery of the service or the opera- tion of the process				x	x	x	x	
	d) management system audits combined with random tests or inspec- tions						x	x	

Table 1 — Building a product certification scheme

^a Where applicable, the activities can be coupled with initial audit and surveillance audit of the applicant's management system (an example is given in ISO/IEC Guide 53) or initial assessment of the production process. The order in which the assessments are performed may vary and will be defined within the scheme.

^b An often used and well-tried model for a product certification scheme is described in ISO/IEC Guide 28; it is a product certification scheme corresponding to scheme type 5.

A product certification scheme includes at least the activities I, II, III, IV and V a).

d The symbol N has been added to show an undefined number of possible other schemes, which can be based on different activities.

WHAT IS PRODUCT CERTIFICATION SCHEME?

- ISO/IEC 17067
- Selection (planning)
 - According to which product standard or design specification?
- Determination (assessment activity needs)
 - Inspection, auditing, testing, assessment and verification
- Review (interpret the effectiveness and results)
 - Check if the result from Determination meet the certification criteria
- Decision on certification
 - Granting certification or need re-assessment?
- Attestation (issue of a statement of conformity)
 - Issue the certification of conformity for product
- Surveillance
 - Periodic inspection and testing (maintain the validity of the statement of conformity)

PARTIES THAT MAY INVOLVED

- Certification Body (CB), an independent third party that in charge of the whole certification process
- Manufacturer (or applicant of the certification scheme), the party who manufacturing the products that need to be certified under the certification scheme
- Testing Laboratory, the party carry out tests to check the performance of product according to defined test method, e.g. BS EN 1634-1 to check the fire resistance performance of fire door
- Auditors, the expert assigned by the CB to carry out the audit to the ISO 9001 or the technical auditor to provide opinion in certifying the scope of application for product

REVIEW OF GLOBAL PRODUCT CERTIFICATION SCHEME (FIRE RATED PRODUCTS)

- Singapore Product Listing Scheme for Passive Fire Protection Product (Fire Resistance and Reaction to Fire)
- China China Compulsory Certification (CCC)
- Mid-East Certification Scheme by Civil Defense
- Australia & New Zealand CodeMark (Voluntary)
- European Union CE Marking (Product Standard)
- Exova Warringtonfire Certifire (Voluntary)
- BRE Global Limited LPCB (Voluntary)
- HK PCCS-PFPP (Adopted by Housing Authority)

PRODUCT CERTIFICATION SCHEME IN HK

- THE PCCS-PFPP is the Product Conformity Certification Scheme of Fire Resistance Product adopted by HKHA
- The PCCS-PFPP was written by the Hong Kong Institution of Steel Construction (HKISC)
- This is prepared specifically for fire door
- The rules in the PCCS-PFPP need to be well defined to avoid misinterpretation by different CBs (inclination to CB with interpretation favor the applicant)
- The PCCS-PFPP have two parts:
 - Administrative Regulations
 - Technical Regulations



PCCS – FD PRODUCT CONFORMITY

CERTIFICATION SCHEME

FOR PASSIVE FIRE PROTECTION PRODUCT - FIRE DOORS

ADMINISTRATIVE PROCEDURES & TECHNICAL REQUIREMENTS

HKISC–FG TECHNICAL GUIDE TG001-1

NOVEMBER 2005

ADMINISTRATIVE REGULATION

- General requirement for administrative procedure of the Certification Scheme, basic requirement, period of surveillance visit or re-certification, condition of acceptance
- Responsibility of Manufacturer
 - Implement ISO 9001 for the management system as well as the manufacturing process
 - Define the documented technical procedures in manufacturing
 - Method of manufacturing, QC procedure, testing required
 - Follow the claimed technical procedure to manufacture the product
- Responsibility of Certification Body
 - Carry out audit on the ISO 9001 system
 - On site inspection of manufacturing process and assess if the manufacturing is fully complied with the claimed procedure
 - Selection of sample for Initial Type Testing
 - Provide technical auditor to assess the scope of certification and witness the test if necessary
 - Issue the Certificate of Conformity

TECHNICAL REGULATION

- General requirement for the technical regulation of the Certification Scheme on specific product
- Define the product from the same family, for example the door provide 60 minutes FRR, but timber door and steel door shall belongs to two different family of product, the test evidences can't be shared
- The product standard and criteria of acceptance
 - For example, door test to BS 476: Part 22: 1987, requires 60 minutes integrity and insulation
- Guideline on the period of surveillance testing or auditing testing and the condition of acceptance

Contact the CB for the need of product certification

Submit information to CB

- What product to be certified
- Evidence on the readily available ISO 9001 certificate, record of evidence for the implementation of the ISO 9001 for certain period
- Performance requirement (e.g. 60 mins FRR of Fire Door)
- Expected range of scope of application (Sizes variations, matching with others ironmongeries, use of alternative fire glass, use of cladding material on doors, etc.)
 - A clear expectation on scope of application is important as this help the technical auditor to define the nos. of tests needed
- Any voluntary on-top performance requirement, e.g. water resistant ability, mould resistant ability.

- Agreement of the scope of certification and fix the tentative date of on site audit, factory inspection and the method of sample selection
- On the date of on site audit and inspection, it would be good to have manufacturing proceeding such that the actual manufacturing process can be inspected
- Sample selection is a critical procedure as this directly related to the scope of certification
 - Selection of sample that can't match with the scope of certification lead to difficulty in obtaining the broadest range of application
- Sample selected from the readily available stock vs the specially made door for broadest range of application.
 - The CB shall ensure that the specially made door is fully complied with the documented manufacture procedures

• On-site Inspection

- Raw material selection
 - Fixed list of suppliers and specification of raw materials
 - The QC process for incoming raw material
 - Necessary pre-treatment for raw material
 - E.g. Timber needs conditioning to control the moisture content?
 - E.g. Steel grade checking
 - E.g. Dimensional and density checking
- Routine QC of each manufacturing process
- Manufacturing of door core
 - Application rate of adhesive and the making of door core
- Assembly of door
 - Slot holes for ironmongeries
 - Method to assembly individual component
 - Nail or adhesive for timber, welding for steel door
 - Application rate of adhesive, etc.

- The design of doorset may have substantial variety in real practice
 - Sizes
 - Configuration (double or single-leaf, double or single-action)
 - Sizes and shape of vision panel
 - Use of ironmongery
 - Use of decorative cladding
- Difficult to have one door tested to represent all, and difficult to select the samples from stock that matches with the proposal
- Technical auditor understand the proposal from applicant and plan the proposed tests necessary that suit the expected scope
- Method of selection:
 - From stock if there are suitable sample or witness the whole manufacturing process
 - Initial Type Test(s) (ITT)

- Perform the Initial Type Test (ITT)
- Initial Type tests are the tests after the audit by the CBs and the samples selected by the CBs to determine the required performance of the product
 - The test may on raw materials (in-house testing)
 - The performance test (FRR)
- The tests will be conducted by laboratory with HOKLAS accreditation to that particular test
- The laboratory may be accredited by other accreditation bodies other than HOKLAS but have MRA with HOKLAS

Certification

- Rectify NC
- Satisfactory ITT results
- Final scope of application
- Decision on certification
- Issue certificate

Surveillance and recertification
Surveillance (9-months period)

Recertification
PCCS-PFPP set 3-years interval

•Audit Test

- PCCS-PFPP, 3 year interval or as specific based on the volume of manufactured products
- Select from current stock, any door as specified by the CB

FIRE DOOR PRODUCT CERTIFICATION

- It is a series of quality assurance process
- Initial factory technical production inspection and quality system audit (ISO 9001)
- Initial selection of ready to be certified fire doors for Type Testing
- Passed fire door to be certified per model
- Surveillance visit at 9 months interval
- Any production > 20 000 fire door-retesting
- Reassessment at every 3 years intervalretesting of certified fire doors per model





Different Models Fire doors







FIRE RESISTANCE GLAZED

DOOR

- Fire resistance glass
- Intumescent firestop door seals-expansion volume up to 50% of initial thickness
- Fire insulation board-JC/T564-2000, GB/T 7019 and GB/T 10294 CaO & SiO2
- Stainless steel frame
- Ironmongery



品名: 防火板 规格: 20*95*2440



Measure volume & calculate the density



Inspection of the production process



Random sampling of the door for type testing



Auditor signed On the randomly Selected door for Initial Type testing



Type testing – Fire resistance test



FIRE RESISTANCE TIMBER DOOR

- Fire resistance timber boards
- Core: size and density of softwood 450kg/m³
- Internal framing : size and density of softwood 450kg/m³
- Outfacing and lipping
- Glazed opening
- Ironmongery

Seasoning of timber



The moisture content of all timber based components shall be 10% \pm 2%



Timber for making cores

415-10-20 2448 30

10, 14x75-65×628=7635

高4号钟 05 次 摘卷 76 05 43 4 4 7 角彩 漫恭

Ats Leiste-gesues sallte

备用家品门

门盖(4) \$25-64 \$628 8,335年 05月 编号:36 05日 06月







One fire door tested for two faces



Fire door test in progress



Appendix A

Guideline for Fire Performance Assessment in lieu of Fire Tests

1. Introduction

This Guideline is issued by the Fire Group of the Hong Kong Institute of Steel Construction. Its main objective is to provide guidance to accredited Certification Bodies in utilizing fire door performance assessments in lieu of fire tests when there are changes (either additions or deletions) to fire protection products which have been tested and certified.

A fire performance assessment must be based upon fire test(s) of a prototype or a fire protection product of the original design. The fire test reports shall be issued by a HOKLAS accredited laboratory or its mutual recognition agreement partner (MRA) endorsed test reports.

As an assessment is a technical expert opinion for a modified fire protection product as if it is subject to a fire test, it shall be carried out by technically competent personnel and reviewed by another competent personnel before the finding is formally issued in an assessment report. This Guideline also defines the requirements of the personnel for performing the assessment and review.

2. Rules for assessment for insignificant changes to approved doors

2.1 Fire performance assessments can only be carried out and assessment reports issued under an organization which shall be a HOKLAS accredited laboratory or HOKLAS overseas Mutual Recognition Agreement (MRA) accredited laboratory. (For information on the updated status of the HOKLAS's MRA partners, please access to the HKAS website at www.itc.gov.hk/hkas).

2.2 The assessment shall be carried out by an Assessor and reviewed by a Reviewer both of them are employers of the accredited laboratory who finally issued the assessment report. An Assessor for performing an assessment shall have a degree in engineering or related discipline with two years experience in fire testing. A Reviewer for reviewing an assessment shall have a higher degree in engineering or related discipline, or corporate membership of a recognized engineering institution with two years experience in fire testing. (Evidence of the qualification and experience of the Assessor and Reviewer shall be provided by the accredited laboratory)

2.3 The assessment shall be within the Scope of Accreditation of the accredited laboratory. For example, an accredited laboratory can only be allowed to perform assessments to BS 476 : Part 22 : 1987 for non-load bearing fire protection products if they are accredited to this standard. This laboratory is not allowed to perform assessments to BS 476 : Part 21 : 1987 for load bearing structural elements nor allowed to perform assessments to AS, ASTM, GB, EN and ISO for non-load bearing fire protection products unless they are also accredited to these standards. (Evidence of the accredited Scope shall be provided by the accredited laboratory which issued the assessment report)

2.4 A fire performance assessment must be based upon fire tests of a prototype or a fire protection product of the original design which are of similar materials and configurations. The test results shall be contained in HOKLAS or its MRA partners endorsed test reports which are within its Scope of Accreditation. (Endorsed test reports mean that the report bearing the HOKLAS or its MRA partners Accreditation Mark or Logo). If interpolation of fire performance is really necessary in an assessment, it shall be based on more than one fire test results with clear evidences and solid arguments to show the validity of this interpolation. Extrapolation of fire performance is in general not accepted.

3. Assessment Report

An Assessment report shall consist of the followings:

(a) Reference to the full-scale test including a general description of the tested item and the specific results achieved relevant to the opinion;

(b) Reference to other supporting information;

(c) A detailed statement of the proposed variation(s);

(d) A summary of the critical issues leading to the opinion, including the main points of the argument and any assumption made A statement of the formal opinion;

(e) The name of the Assessor and the HOKLAS or it MRA Partners Accredited Laboratory who prepares the assessment report and holds full responsibility for making the formal opinion together with his/her signature and date;

(f) The name of the Reviewer and the HOKLAS or it MRA Partners Accredited Laboratory who reviews the assessment report and holds full responsibility for the review together with his/her signature and date.

A statement shall be included in the assessment stating that it has been carried out in accordance with this Guide. For laboratories accredited by HKAS for fire testing, HOKLAS Accreditation Mark may be used in the fire assessment report provided that the

(a) following statement shall be included in order to comply with the HKAS requirements. *"The statements and interpretations expressed in this assessment are outside the scope of HOKLAS accreditation"*

(b) The signature page of the assessment report shall bear the following statement *"This assessment report is not valid unless it is duly signed by the Assessor and Reviewer"*

4. Significant Variations to Certified Fire Protection Products

If the variations to a tested and certified fire product protection product are of significant nature, a full scale fire test shall be carried out as if it is a new model or a new fire product protection product to be certified.

CONCLUSION

- Advantages:
 - The Product Certification gives confidence in the product quality
 - Clear Picture for the Approval Authority or the End-user to accept the Product
 - Guarantee safety level of buildings
 - Better matching with products that gain the Product Certification as well
 - Manufacturer save cost in long term due to the setup of good management system
 - Better allocation of human power
 - Well defined procedure to avoid mistake and error
 - Better quality minimize products with defect
 - Continuous monitoring to discover invisible or un-expectable changes
 - Better traceability to easily rectify error

CONCLUSION (CONT')

• Disadvantages:

- The Product Certification limited the design variation
- The product can only match with others under the same Certification Scheme
- Need initial investment to setup the management systems
- Need time to adopt the product certification

