

Cover Story 封面故事

Materials Engineers - Professionals in Testing and Certification Sector Upholding Quality of Construction

檢測認證專業材料工程師 為建造工程安全及品質把關

In recent years, infrastructure and construction projects in Hong Kong are being carried out in full swing. The quality of the construction materials used and the strictness of the quality control procedures form an essential part of the safety and quality of these projects. Unbeknownst to many people, such high standard is being upheld by a group of professionals working in the T&C sector, namely materials engineers.

In this issue, we are honored to have Ir Professor Joseph Mak, Chairman of Materials Division of Hong Kong Institution of Engineers (HKIE), to share with us the contributions made by materials engineers in ensuring the overall safety and quality of construction projects in Hong Kong, and ways to gain recognition of the qualifications for these professionals.

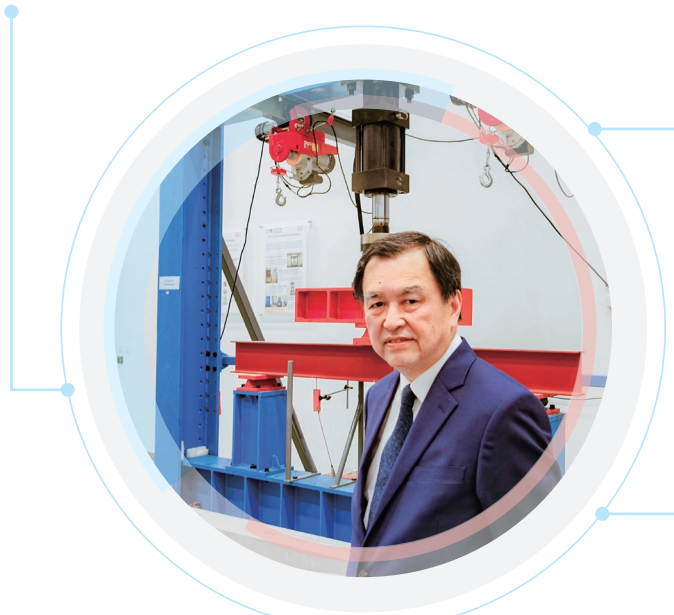
Expert in assuring quality of construction works

Materials engineers are the experts who can apply their materials science, technology and engineering knowledge to meet engineering challenges through the use of advanced and reliable materials. They are engaged in a wide variety of fields, from management of construction, material factories and laboratories, to certification and audits, and research and development.

Ir Professor Mak explained, "There are around 700 materials engineers in Hong Kong. The organisations they work for are diverse, ranging from government departments, works consultants and contractors, accredited laboratories, construction materials factories and certification bodies. All of these organisations have one thing in common – being responsible for the quality control of construction materials, which in turn brings out the core work of a materials engineer."

Based upon international and local standards, materials engineers supervise comprehensive on-site or laboratory tests on construction materials to see if they meet the relevant requirements. In addition, they participate in the entire production and construction process by checking the operation and making sure the products are being produced and assembled according to standards.

Ir Professor Mak pointed out, "Construction work involves numerous procedures including planning, design, audit, production



▲ Ir Professor Joseph Mak, Chairman of Materials Division of Hong Kong Institution of Engineers
香港工程師學會材料分部主席麥耀榮教授工程師

近年，香港的基建及建築工程項目進行得如火如荼，優質的建築材料以及嚴謹的品質控制程序對工程項目的安全和質素起關鍵作用。大家可能有所不知，檢測認證行業當中有一班專業材料工程師，一直肩負起監管建築材料以致工程各部分質量的重責，為工程的品質及安全把關。

今期，我們很榮幸邀請到香港工程師學會材料分部主席麥耀榮教授工程師接受訪問，分享材料工程師在確保工程項目的品質及安全中所擔當的角色，以及如何獲取有關專業資格。

建造工程品質專家

材料工程師是一門專業，他們運用其材料科學、科技及工程上的專門知識，利用先進而可靠的物料解決工程上的疑難。他們所涉獵的工作範疇非常廣泛，由建造工程、物料工廠和實驗室管理，到審計和認證，甚至研發領域都可以見到他們的足跡。

of construction materials/components and inspection of the finished work. While professional engineers of other disciplines are involved in specific part of the whole process, materials engineers are involved in almost every step to ascertain quality control of the whole construction work. It is fair to say that the independency and expertise of materials engineers made them the irreplaceable gatekeepers for the T&C sector.”

Recognition of professional materials engineers

To become a professional materials engineer, one could choose to obtain a university materials degree covering a wide spectrum of materials knowledge, including the physical and chemical properties of inorganic, organic and composite materials, and apply for HKIE membership in the materials discipline after gaining sufficient relevant work experience.

Ir Professor Mak has been the key person in driving the recognition of more materials engineers. He said, “To satisfy the academic criteria for HKIE membership, candidates are basically trained in the university under a materials degree, but the pool of eligible graduates is relatively limited in local. In fact, there are many materials engineers working in laboratories, factories and construction sites across the city but very few of them have a materials degree despite their plentiful experience in the field.”

In view of this, the Materials Division of HKIE streamlined the route to memberships in November 2018 by opening up the academic requirements for entry. Applicants holding recognised academic qualifications meeting the academic requirements of building, civil, chemical, environmental and structural engineering disciplines with two subjects in construction engineering materials at undergraduate level or above can now apply for HKIE membership in the Materials Division. They also need to possess a minimum of 6 years of working experience in the relevant field after graduation. In the absence of one or two of these subjects, they may need to take top-up courses before application.

“It is a big leap for the Materials Division and we anticipate seeing more and more engineers to join the materials discipline and contribute their expertise to the T&C sector, which in turn will benefit the construction industry in Hong Kong.” Ir Professor Mak remarked.

麥教授工程師解釋：「香港現有大約七百位材料工程師，分佈在不同類型的機構工作，包括政府部門、工程顧問、認可實驗室、建造物料工廠及認證機構等；他們工作性質有一個共通點，就是對建材物料進行嚴格的品質監控。」

材料工程師會根據國際及本地的品質標準和規範，在工地或實驗室進行全面的建材物料測試，以確定其達到有關標準的要求。另外，在建材的整個生產和建造過程中，他們會審視其運作流程，以確認產品生產和組裝符合標準。

麥教授工程師指出，建造工程涵蓋多個部分包括規劃、設計、審批、建材及組件生產和審視完工。一般專業工程師通常基於其專業領域只會參與工程特定的部分，材料工程師卻因從事品質控制方面的工作，每每參與工程的多個環節。由此可見，材料工程師的獨立性及專業性在整個工程項目中十分重要，他們作為檢測認證業把關者的角色是無可取代的。

材料工程師的專業資格

有志成為材料工程師的人士，可選讀有關材料工程的大學學位課程，有系統地學習材料科學的知識，包括無機、有機及複合材料的物理和化學特性等。他們畢業後累積足夠相關工作經驗，便可考取香港工程師學會的專業資格。

麥教授工程師一直在推動材料工程師專業認可上不遺餘力。他說：「要滿足香港工程師學會專業資格的學術要求，申請者需要在大學修讀材料學科，但有關學科的本地畢業生數目有限。事實上，本港現時有很多在不同的實驗室、工廠和工地從事材料工程的同業，都擁有豐富經驗，但當中具有物料學位的人卻為數不多。」

有見及此，香港工程師學會材料分部於2018年11月起放寬了專業資格的學術要求。申請者只須具備建造、土木、化學、環境或結構工程的認可學術資格，而其學士或以上程度的學位課程當中有兩科與建造工程物料相關，便可向香港工程師學會材料分部申請專業資格。如未有修讀足夠兩科有關建造物料的科目，或要完成銜接課程才可申請。

麥教授工程師表示：「放寬安排對材料分部來說無疑是跨越了一大步，我們期望更多工程師加入材料工程的行列，讓他們能發揮其專業所長，為檢測認證業出力，這亦是香港建造業之福。」



New Opportunities for Testing and Certification in the Mainland

內地的檢測認證新機遇

Lastest News
最新消息

In the past year, Hong Kong and the Mainland have reached new arrangements to further facilitate bilateral trading activities. This has presented the testing and certification (“T&C”) sector in Hong Kong with new opportunities to develop the Mainland market.

In December 2018, the Agreement on Trade in Services signed under the CEPA framework was amended to extend the scope of China Compulsory Certification (“CCC”) testing that can be undertaken by testing organisations in Hong Kong to cover all products processed or manufactured in the Mainland requiring CCC. Its implementation guide was promulgated in February 2019. This new move has relaxed the restrictions on product category and geographical location set out in earlier CEPA agreements, enabling the local T&C sector to take up a more prominent role in serving the Mainland market.

In the same month, the CEPA Agreement on Trade in Goods was also concluded. It contains a number of provisions that outline the general direction of exploring mutual recognition of conformity assessment results between the Mainland and Hong Kong. Details of the T&C-related provisions under CEPA could be viewed at www.hkctc.gov.hk/en/cepa/index.html.

The development of the Guangdong-Hong Kong-Macao Greater Bay Area (“Greater Bay Area”) is a key strategic plan in the country’s development blueprint. Promulgated in February 2019, the Outline Development Plan for Greater Bay Area sets out the general guiding directions for development. It reinforces that the implementation of liberalisation measures for Hong Kong’s service sectors (including the T&C sector) under CEPA will be deepened, and that it supports Greater Bay Area enterprises in using Hong Kong’s T&C services.

Looking ahead, HKCTC would further promote Hong Kong’s T&C services in the Greater Bay Area, and continue to strive for further liberalising the Mainland market.



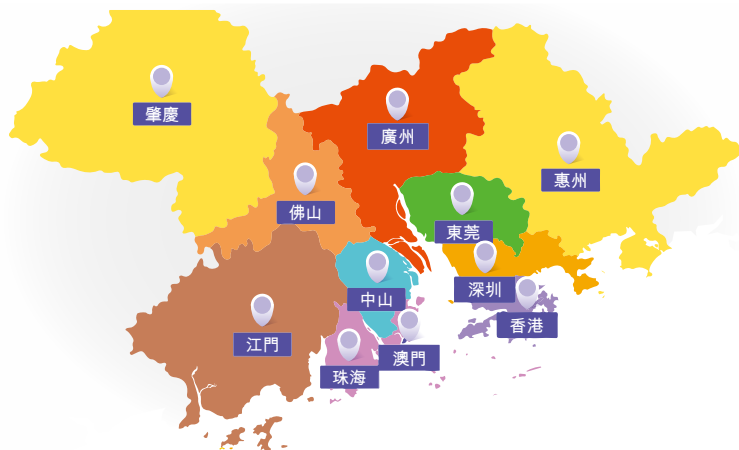
過去一年，香港與內地就進一步促進雙邊貿易活動達成了新安排，這為香港的檢測認證業界帶來發展內地市場的新機遇。

2018年12月，在CEPA框架下簽訂的《服務貿易協議》經修訂，將可供香港檢測機構承擔的中國強制性產品認證(“CCC”)制度之測試工作範圍，擴大至在內地加工或生產的CCC目錄內的所有產品。有關實施指南已於2019年2月公布。此舉放寬了以往在CEPA協議內對產品類別和生產/加工地域上的限制，讓本地業界在服務內地市場上可擔當更重要的角色。

同月，內地與香港簽訂了CEPA《貨物貿易協議》，涵蓋若干關於探討香港和內地檢測認證結果互認的概括性條文。CEPA中檢測認證相關條文的詳細內容，請參閱 www.hkctc.gov.hk/tc/cepa/index.html。

粵港澳大灣區建設是國家的重大發展戰略。2019年2月發布的《粵港澳大灣區發展規劃綱要》，載述了引領大灣區發展的大方向。《規劃綱要》提及深化落實CEPA對港服務業（包括檢測認證業）的開放措施，並支持大灣區企業使用香港的檢驗檢測認證服務。

展望未來，香港檢測和認證局會在大灣區進一步宣傳香港的檢測和認證服務，並繼續尋求開放內地市場。



Embracing New Technologies in Testing and Certification 檢測認證業迎接新科技

Technology has never been playing such an important role in all aspects of life. Robotics, automation, artificial intelligence, big data, blockchain, etc. are developing at an astonishing speed around the globe. Different industries have been trying to apply these technologies to optimise production and improve operational efficiency, as well as grasp the opportunities of new markets brought about by the new technologies. Testing and certification (T&C) sector is no exception. To exchange insights on how the T&C sector could embrace the opportunities in this new era, HKCTC and the Hong Kong Accreditation Service co-organised the “Seminar on New Opportunities for Testing and Certification in the Age of Technology” on 18 March 2019.

In the first part of the seminar, Mr Tony Wong, Assistant Government Chief Information Officer (Industry Development) of the Office of the Government Chief Information Officer (OGCIO) outlined the Government’s key initiatives in developing Hong Kong into a smart city. Mr Simon Wong, Chief Executive Officer of the Logistics and Supply Chain MultiTech R&D Centre (LSCM), introduced the latest available technologies that could enhance a testing laboratory’s operational efficiency. He shared some cases of adopting robotics, RFID and automation systems in sample preparation, resources management and warehouse operation. He encouraged the T&C sector to leverage innovation and technology to transform its operation and offer enhanced services to clients. After that, Dr Steven Yang, Senior Electronics Engineer of the Standards and Calibration Laboratory, Innovation and Technology Commission, gave an update on quantum measurement standards and new trends in electrical metrology.

The second part of the seminar started with an analysis of the future market trend in adopting new technologies by Mr Basil Wai, Chief Executive Officer of the Hong Kong Electronics Industries Association. He pointed out that the emergence of smart products and Internet of Things would generate new demands for quality and safety assurance. Lastly, Ms Shirley Chan, Manager (Innovation and Technology Fund) of the Innovation and Technology Commission, explained in detail the enhancement measures of the Technology Voucher Programme effective from February 2019 to support companies of all sizes to use technological services and solutions to improve productivity, or upgrade or transform their business processes.



▲ A group photo of speakers and organiser
講者及主辦機構嘉賓合照

◀ The seminar attracted some 120 participants
約 120 位人士參加研討會

科技浪潮席捲全球，滲入我們生活每一個細節，機械人、自動化系統、人工智能、大數據、區塊鏈等科技發展一日千里。各行各業都希望藉應用這些新科技來優化生產，提升運作效率，並且把握由科技衍生的新端市場所帶來的機遇，而檢測和認證業也不例外。為探討檢測和認證業可如何在這個新時代抓緊機遇，香港檢測和認證局和香港認可處於 2019 年 3 月 18 日聯合舉辦了「檢測認證在科技時代的新機遇研討會」。

在研討會的首部分，政府資訊科技總監辦公室助理政府資訊科技總監（產業發展）黃志光先生概述了政府致力發展香港成為智慧城市的主要措施。而物流及供應鏈多元技術研發中心行政總裁黃廣揚先生則介紹了可應用於測試實驗室的最新科技，以提升運作效率。他又分享了不同個案，介紹一些機構如何應用機械人、無線射頻技術和自動化系統，以協助樣本製備、資源管理及倉庫運作。他鼓勵檢測和認證業善用創新科技提升效率和客戶服務。隨後，創新科技署標準及校正實驗所高級電子工程師楊承隆博士介紹了量子測量標準的最新動向，以及電學計量的趨勢。

研討會的下半部，由香港電子業商會行政總裁衛紹邦先生分析未來市場應用新科技的趨勢。他指出智能產品以及物聯網的湧現，會製造更多對品質和安全檢測的需求。最後，創新科技署經理（創新及科技基金）陳嘉慧女士詳細解說科技券計劃於 2019 年 2 月推出的優化措施，資助各大小企業使用科技服務和方案，以提高生產力或升級轉型。

Testing and Certification Service Safeguards Food Safety and Hygiene 檢測認證服務 保障食品安全和衛生

Consumers have become increasingly vigilant about food safety and quality. Serving as a gatekeeper, the testing and certification (T&C) sector assists the food trade in ensuring their hygiene standards and meeting local regulations. It also helps the catering industry to enhance consumers' confidence through food certification.

On 5 March 2019, HKCTC, the Hong Kong Accreditation Service and the Food Safety and Technology Research Centre (FSTRC) of the Hong Kong Polytechnic University jointly organised the "Seminar on Testing and Certification for Food Safety". The seminar attracted some 120 participants.

In the seminar, Dr Leung Ka-sing, Advisor of FSTRC, introduced the Food Hygiene Standard Certification System (FHSCS), a food hygiene system based on hazard analysis critical control point (HACCP) principles. Dr Leung mentioned that while ISO 22000, as an international standard on food safety management, involved ISO 9001 system and HACCP principles, its certification requirement is not practicable for local catering industry due to multiplicity of local food products as well as lack of standardised methods in Chinese-style food preparation. To better meet the need of local catering industry, which comprises mainly small and medium establishments, in upgrading their food hygiene standard, FSTRC has developed the FHSCS.

AsiaWorld-Expo Management Limited is the first catering establishment to be awarded with FHSCS certification. The company's Senior Manager, Mr Darwin Tang, shared with audience the implementation of FHSCS in their central kitchen and Arena Kitchen, and benefits brought by this certification - assuring food safety and hygiene, strengthening customers' confidence and enhancing company's image.

The seminar also introduced latest development in food safety technology and regulation. Dr Wong Ka-hing, Executive Director of FSTRC, briefed the audience on the Centre's research projects, such as the development of a rapid detection technique for formaldehyde in food samples. Ms Joan Yau, Scientific Officer of Centre for Food Safety, Food and Environmental Hygiene Department, presented the latest regulation of metallic contamination in food. Lastly, Dr Chu Hei-shing, Chemist of Government Laboratory, introduced their development work related to the Food Adulteration (Metallic Contamination) (Amendment) Regulation 2018.



Food Hygiene Standard Certification System enhances customers' confidence in catering establishments' food hygiene level
食品衛生標準認證系統有助增強客戶對餐飲場所食品衛生水平的信心



A group photo of speakers and organiser 講者及主辦機構嘉賓合照

現今消費者愈來愈注重食品安全及品質，檢測和認證業一直充當把關者，幫助食品業符合衛生標準和本地規管要求，同時亦透過食品認證服務，協助餐飲業提升顧客的信心。

香港檢測和認證局、香港認可處及香港理工大學食物安全及科技研究中心於2019年3月5日合辦了「食品安全的檢測認證研討會」。是次研討會吸引了120名人士出席。

研討會上，食物安全及科技研究中心顧問梁嘉聲博士向參加者介紹了食品衛生標準認證系統 (FHSCS)，該系統是一套建基於危害分析與關鍵控制點 (HACCP) 原則的食品衛生體系。梁博士指出，ISO 22000 是針對食品安全管理而訂定的國際標準，結合了 ISO 9001 質量管理體系的要求與 HACCP 原則。然而，香港餐飲業的食品種類多樣化，加上中式料理一般欠缺統一的烹調方式，因此業界難以直接實施有關標準。為了更能切合本地餐飲業包括中小型餐飲場所的需要，食物安全及科技研究中心推出了 FHSCS，協助業界提升食品衛生水平。

亞洲國際博覽館管理有限公司（亞博館）是第一間獲得 FHSCS 認證資格的餐飲機構。亞博館高級經理鄧偉賢先生跟與會者分享在中央廚房和 Arena Kitchen 推行 FHSCS 的經驗，以及取得此認證所帶來的好處，包括確保食品安全和衛生、加強客戶信心及提升公司形象。

是次研討會亦介紹了食品安全在科技與法規方面的最新發展。食物安全及科技研究中心執行總監黃家興博士簡介中心在不同範疇的研究項目，包括可快速檢測食物中甲醛含量的新檢測平台。食物環境衛生署食物安全中心科學主任邱頌韻女士則介紹有關食物中金屬污染物的最新法例。最後，政府化驗所化驗師朱希成博士講解其部門對應《2018年食物攪雜（金屬雜質含量）（修訂）規例》的檢測研發工作。

HKCTC Website Takes New Look!

香港檢測和認證局網頁 全新面貌亮相

HKCTC has launched its revamped website (www.hkctc.gov.hk) with a fresh layout in March this year.

The revamped website adopts a user-oriented approach to enable different user groups (testing and certification bodies and practitioners, testing and certification service users, teachers and students as well as general public) to obtain information they need in just a few clicks.

You are most welcome to visit the revamped website for information on testing and certification, as well as updates on HKCTC's events and activities.

香港檢測和認證局在今年3月推出了新版網頁。

新版網頁的設計以用家的角度出發，讓不同人士包括檢測認證機構和從業員、檢測認證服務使用者、老師與學生以及公眾人士，可更方便快捷地獲取所需的資訊。

歡迎大家瀏覽新版網頁，獲取有關檢測和認證的最新資訊，並留意本局活動的最新動向。



Ethics Corner

誠信錦囊

To foster a culture of honesty and integrity, testing and certification organisations shall issue and implement a code of conduct for all personnel, including their directors, for compliance. The code of conduct shall cover at least the following aspects:

為培育誠信文化，檢測認證機構應發出及實施一套恰當的紀律守則，供全體人員（包括董事）遵守。守則內容應至少包括以下方面：



Prevention of bribery
防止賄賂



Compliance with laws of Hong Kong or of relevant jurisdictions
遵守香港或其他相關司法管轄區的法例



Compliance with professional standards
遵守專業標準



Avoidance of conflict of interest
避免利益衝突



Keeping information confidential
保密資料



Handling of outside employment
處理外間兼職



Handling of relationship with customers, suppliers and contractors
處理與顧客、供應商及承辦商的關係

Competitions Arouse Students' Interests in Testing and Certification

比賽提高學生對檢測的興趣

Promoting youngsters' awareness of the importance of testing and certification (T&C) services has been a work focus of HKCTC. HKCTC has been partnering with different associations to incorporate the elements of T&C into student competitions, providing an opportunity for students to learn about the T&C sector and to understand its role.

Hong Kong Youth Science and Technology Innovation Competition

In collaboration with the Hong Kong New Generation Cultural Association (HKNGCA), we have set up the "HKCTC Special Award for Outstanding Project in Testing" as part of the Hong Kong Youth Science and Technology Innovation Competition. Finalist teams with projects related to testing were chosen to compete for the HKCTC Special Award on the day of final judging. The final assessment was made by the Chairman and four Members of HKCTC who visited the teams' booth to listen to their presentation.

The judges were highly impressed by the technical proficiency and innovative ideas showcased by the students. While some teams were praised for showing that testing could be done by less costly and time-consuming methods, others impressed the judges by linking their ideas with practical applications. The award has provided the students with insight on the crucial role that testing has played in various aspects of our daily life.



▲ (Left) The judging panel visited the finalists' booth on the day of final judging
(左) 評判團於總評當天到訪參賽隊伍的攤位



▲ (Right) Finalist teams visited a commercial testing laboratory to understand more about T&C
(右) 入圍隊伍參觀商業測試實驗室，進一步了解檢測和認證

香港青少年科技創新大賽

香港檢測和認證局與香港新一代文化協會合作，於香港青少年科技創新大賽中設立了「香港檢測和認證局傑出檢測特別獎」。主辦單位甄選出與測試有關的入圍作品，其參賽隊伍再於比賽總評日一較高下。由香港檢測和認證局主席及四位成員組成的評判團當天到訪了參賽隊伍的攤位，聆聽他們的講解，最後選出優勝隊伍。

評判團非常欣賞參賽隊伍能嘗試研發更低成本而省時的測試方法，並充分考慮創作的概念能否被實際應用。學生所展現的豐富科學知識和創新想法，令評判團留下深刻印象。這個獎項亦令學生體會到測試在日常生活各層面都不可或缺。

香港檢測和認證局十分重視向青少年宣傳檢測和認證的重要性，近年亦與不同協會合作，把檢測認證的元素融入學生比賽中，讓學生有更多機會認識檢測和認證業，以及了解行業的角色。

Digi-Science Video Production Competition

HKCTC has been co-organising the Digi-Science Video Production Competition with the Hong Kong Association for Science and Mathematics Education. Students were asked to produce a two-minute video to present their experimental work on the theme of "Testing Science for Green Living". In addition, they had to submit a report on the principles and safety-related aspects of their experiment.

A total of 27 school teams participated in the competition this year. The judges were delighted that the competing teams had demonstrated keen interests in science and strong analytical ability. The competition has inspired greater interest among students to apply testing science in solving daily problems.

數碼科學短片製作比賽

由香港檢測和認證局與香港數理教育學會合辦的數碼科學短片製作比賽，要求學生按「檢測科學－綠色生活」的主題，製作兩分鐘的短片展示實驗過程和結果。他們亦需要遞交報告，解釋實驗中採用的科學原理和安全措施。

今年共有 27 支參賽隊伍，評判欣見參賽隊伍對科學有濃厚興趣，而且具出色的分析能力。比賽成功引發學生興趣，應用測試科學解決日常生活的迷思。



▲ (Up) Participating students attended the competition briefing
(上) 參賽學生出席比賽簡介會

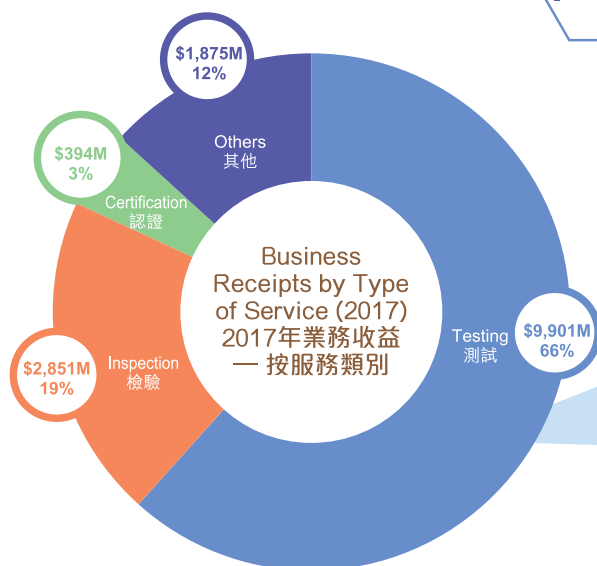
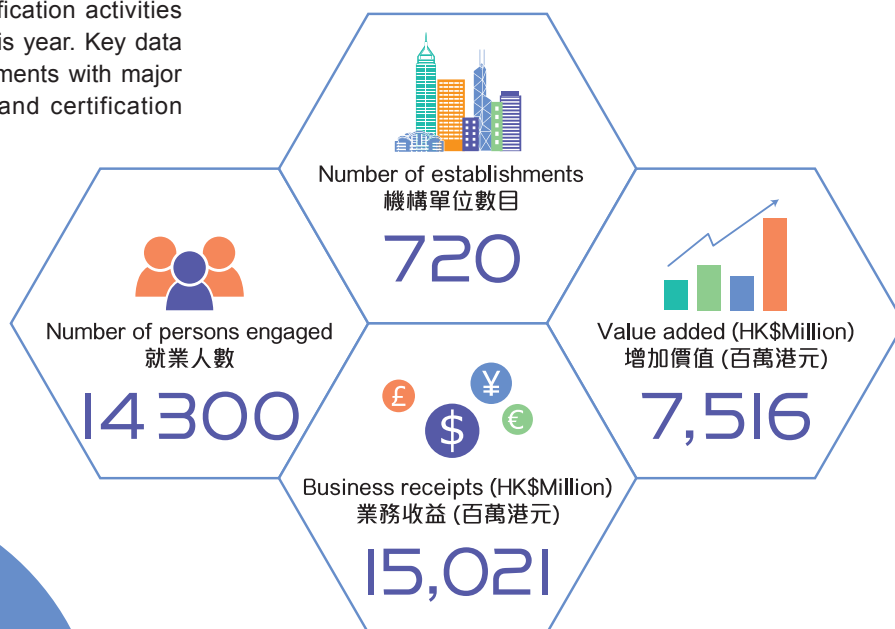
▲ (Down) Prize presentation ceremony
(下) 頒獎典禮

Latest Statistics of Testing and Certification Activities in Private Independent Establishments

私營獨立機構檢測認證活動的最新統計數字

The 2017 statistics of the testing and certification activities in Hong Kong have been released earlier this year. Key data regarding the private independent establishments with major economic activities in testing, inspection and certification services are set out below.

2017 年香港檢測和認證活動的統計數字經已公布，有關主要從事測試、檢驗和認證活動的私營獨立機構單位的主要數據如下。



Business Receipts from Rendering Testing Services by Products/Services Tested (2017)
2017年從測試獲得的業務收益 — 按產品/服務類別



For more details about the statistics, please visit HKCTC website:
有關統計數字的詳情，請瀏覽香港檢測和認證局網站：
www.hkctc.gov.hk

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