

引入全新電腦斷層掃描器 協助落實「智慧海關藍圖」

New Computed Tomography Scanners Help Implement Smart Customs Blueprint

機電署為香港海關(海關)引入全新電腦斷層掃描器，全方位偵測違禁品。新設備已在邊境管制站使用，可提升海關檢查工作的效能，協助海關落實「智慧海關藍圖」。

The EMSD has introduced new computed tomography (CT) scanners, which can conduct contraband detection from all angles, for the Customs and Excise Department (C&ED). The new equipment having been put into use in the control ports can enhance the inspection efficiency of the C&ED and help the department to implement the Smart Customs Blueprint.



新電腦斷層掃描器已在邊境管制站使用。

A new CT scanner has been put into use in one of the control ports.



新設備可360度掃描物件，並以三維影像呈現掃描結果。

The new equipment can scan objects from 360 degrees and present the scanning results with 3D images.

採用新型電腦斷層掃描技術

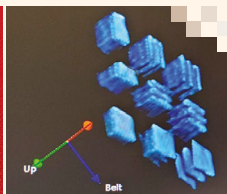
新掃描器經歐洲民用航空會議認證並符合《輻射條例》的規定，可360度掃描物件並記錄物件的多個斷層影像，再通過電腦技術重組成三維立體影像。與只能產生二維影像的傳統掃描器相比，新掃描器能夠進行三維掃描，其X光射線更能穿透厚金屬，令掃描時的干擾減少，影像更清晰，有效提升偵測靈敏度。新掃描器還配備了人工智能，可在完成掃描後自動分析影像數據，協助偵測可疑物件並進行初步篩查，方便海關人員決定是否需要進行深入搜查。

使用前預先進行精準測試

為確保新設備能夠精準運作，機電署工作改善小組自行設計測試組件，並使用三維打印機打印組件，又以雷射切割不同尺寸的高精度不鏽鋼金屬片作為測試時的模擬干擾源，以詳細測試新掃描器的三維掃描功能、精確度和穩定性。

工作改善小組預先準備測試組件，以供進行新設備的精準測試。

The Works Improvement Team prepared the test components in advance for conducting precision testing of the new equipment.



新設備能精準掃描不同角度、大小及厚度的物件。

The new equipment can scan objects of different angles, sizes and thickness precisely.

未來研究方向

為進一步協助海關的檢查工作，我們會持續研究掃描器的應用及人工智能技術，務求利用該設備成功偵測更多類別的違禁品，並提升檢查效能。

Introducing New CT Scanning Technology

Certified by the European Civil Aviation Conference and in compliance with the requirements of the Radiation Ordinance, the new scanners can scan objects from 360 degrees, record multiple cross-sectional images of the objects and re-create their three-dimensional (3D) images using computer technology. Compared with conventional scanners which can only produce two-dimensional images, the new scanners are capable of performing 3D scanning and the X-rays of which can even pass through thick metals, reducing interference during the scanning process and creating clearer images, thus effectively enhancing detection sensitivity. Equipped with artificial intelligence (AI), the new scanners can also analyse image data automatically after scanning to help with detecting suspicious items and conducting preliminary screening, so that the C&ED officers can decide whether a thorough check should be conducted.

Precision Testing of the New Scanners before Operation

To ensure that the new equipment can operate precisely, the Works Improvement Team of the EMSD designed test components and printed them with 3D printers. High-precision stainless steel sheets were also cut into different sizes with a laser to simulate the sources of interference in the test. Using these test components, we thoroughly tested the 3D scanning functions of the new scanners as well as their precision and stability.

Future Research Direction

To further assist the C&ED's inspection work, we will constantly study the use of the scanners and AI technology, with a view to using the equipment to detect more types of contraband and enhancing the inspection efficiency.