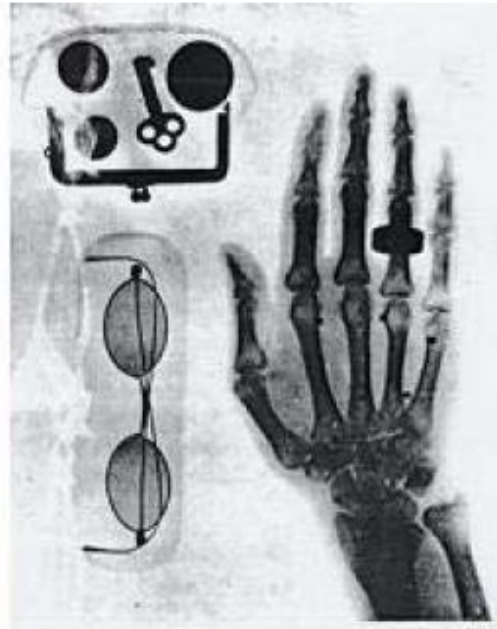


Non Destructive Inspection

非破壞檢測CT在模具塑件成品與各類型樣品上的應用分享

Ben

非破壞檢測是什麼？

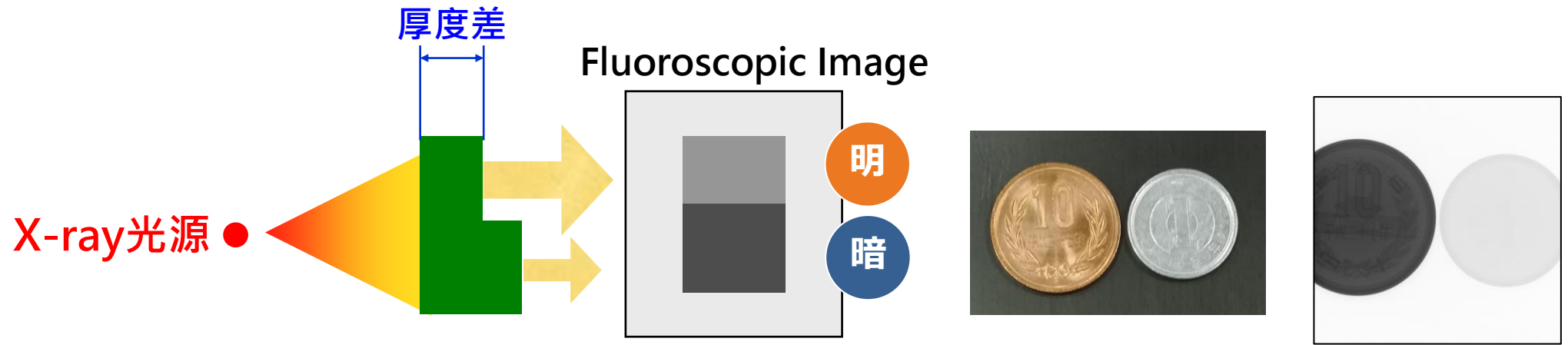


德國的琴倫發現X線的存在。

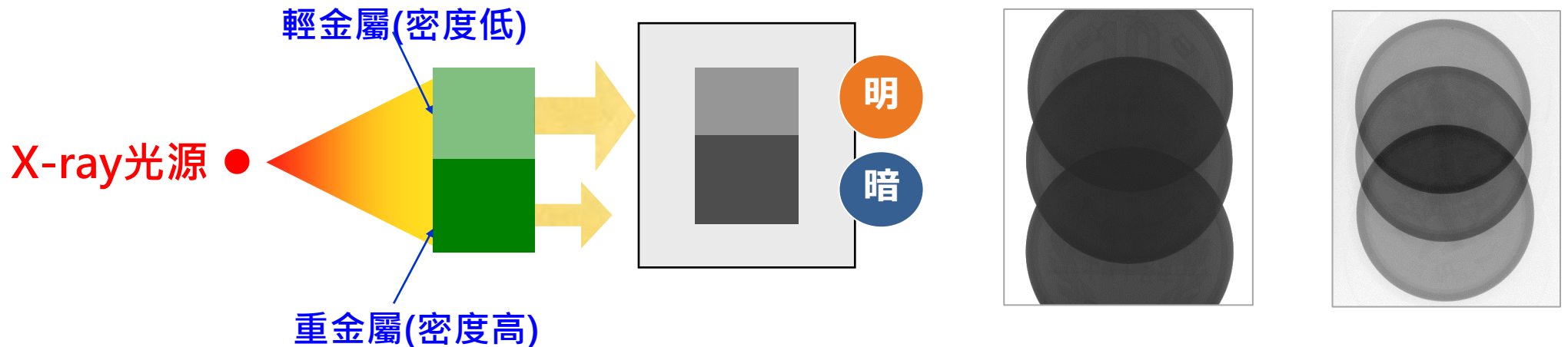
(株)島津製作所經由1918年到1936年間開發汎用型 醫療用X線裝置「黛安娜號」

非破壞檢測Non Destructive Inspection，簡稱NDI。
包含**超音波檢測**、**磁粒檢測**、**射線檢測**等等方法，其中X-ray射線檢測泛用在醫療用途，檢查人體內部器官的狀況。而工業用設備，觀察模具內部、電池電芯、電子產品等等物件上。

X光成像原理



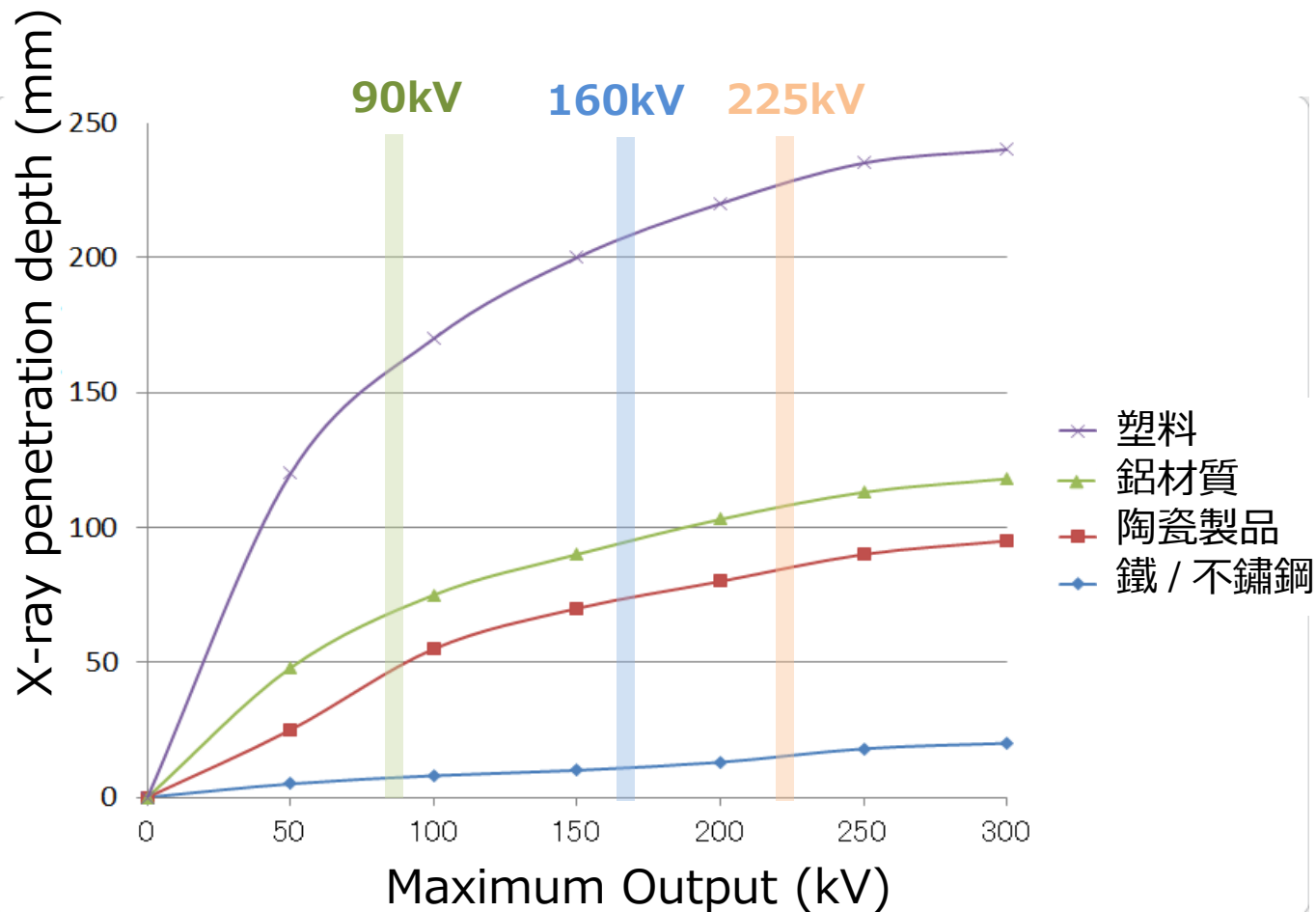
相同密度下，因為厚度的差異，最終透過X射線的強度也會有所差異。



主要是利用對象(材料)的密度差、厚度差而形成的灰階影像會有所差異。

• X射線入射強度 - 被物體吸收強度 = 透過X射線的強度

常見關鍵性能-電壓kV 穿透能力



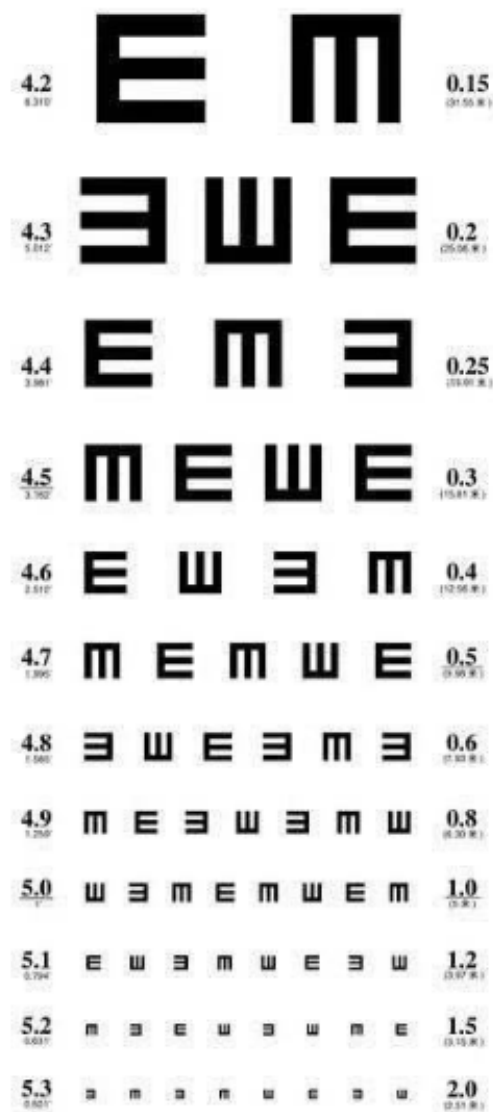
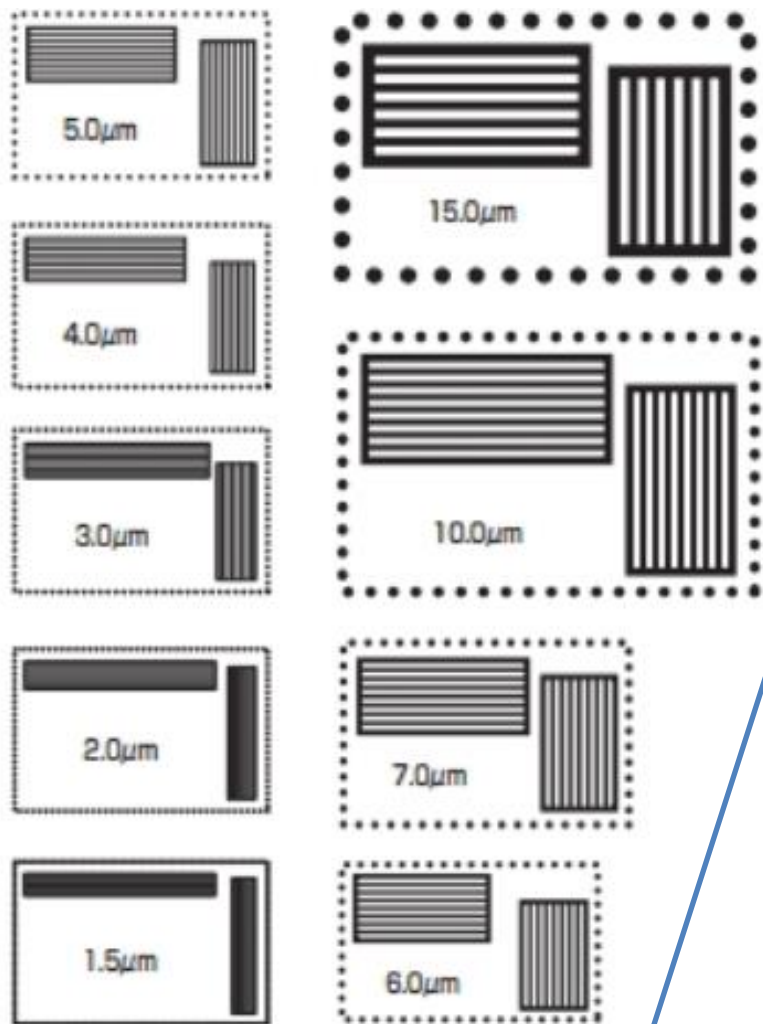
電壓	材質	穿透厚度
90kV	塑料	160mm
	鋁材質	70mm
	陶瓷製品	50mm
	鐵 / 不鏽鋼	10mm

電壓	材質	穿透厚度
160kV	塑料	210mm
	鋁材質	90mm
	陶瓷製品	75mm
	鐵 / 不鏽鋼	15mm

電壓	材質	穿透厚度
225kV	塑料	230mm
	鋁材質	125mm
	陶瓷製品	80mm
	鐵 / 不鏽鋼	20mm

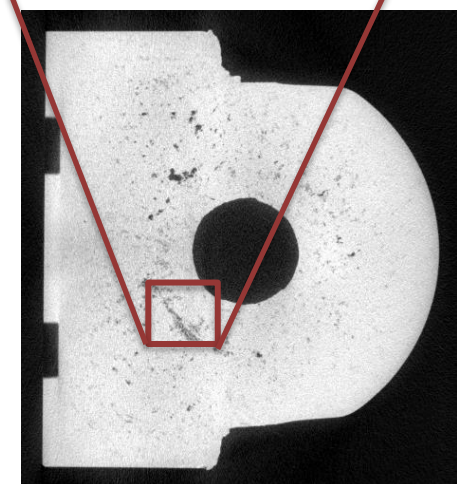
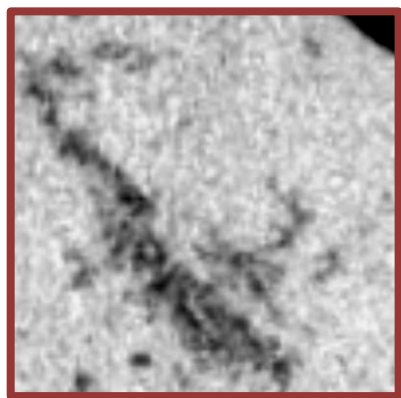
常見關鍵性能-解析度

視力

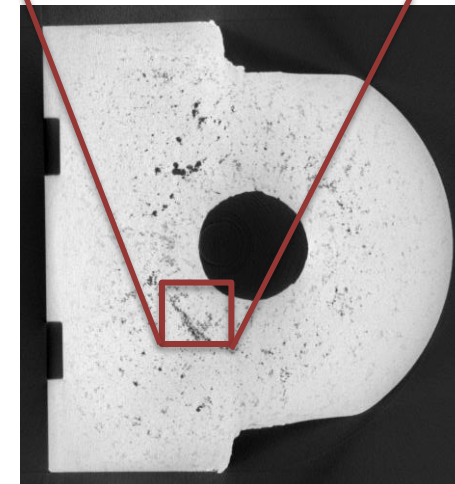
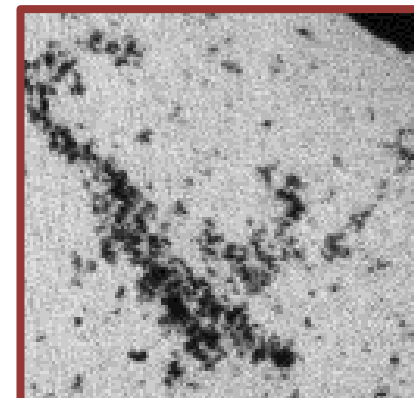
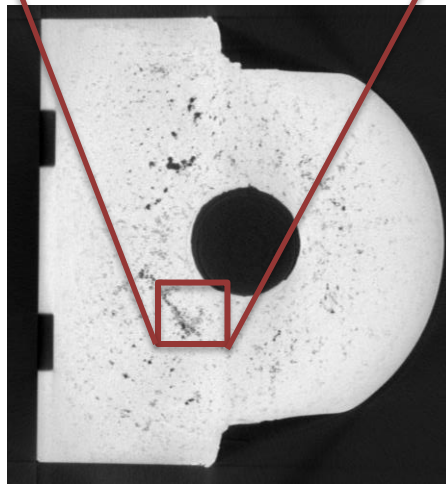
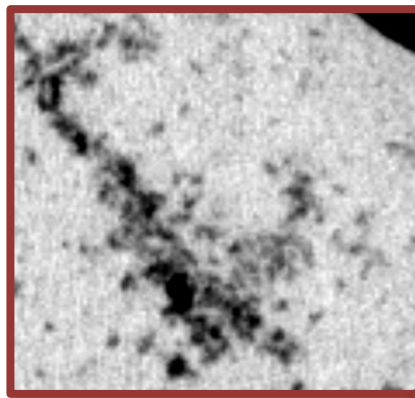


常見關鍵性能-畫素Pixel

畫質

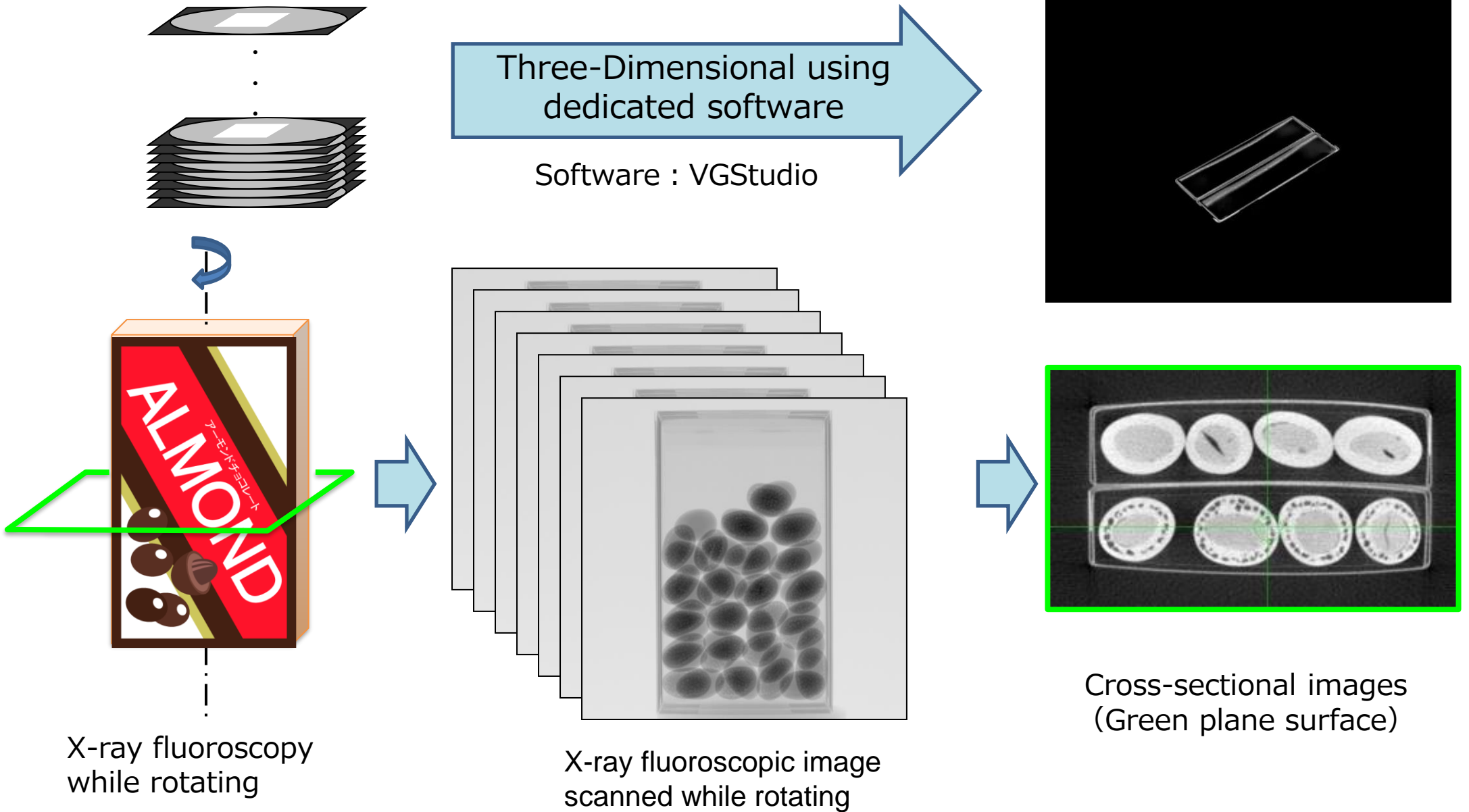


1,000,000pixels



14,000,000pixels

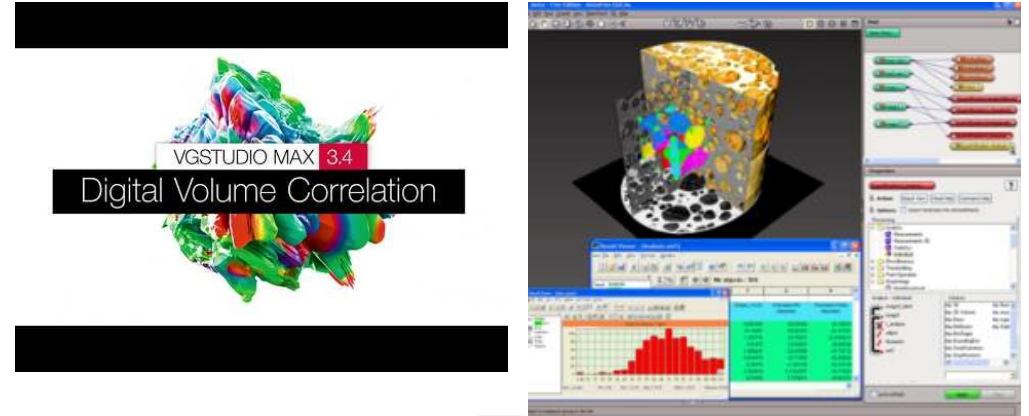
3D斷層掃描的過程(CT)



硬體與軟體的分工



Shimadzu CT設備

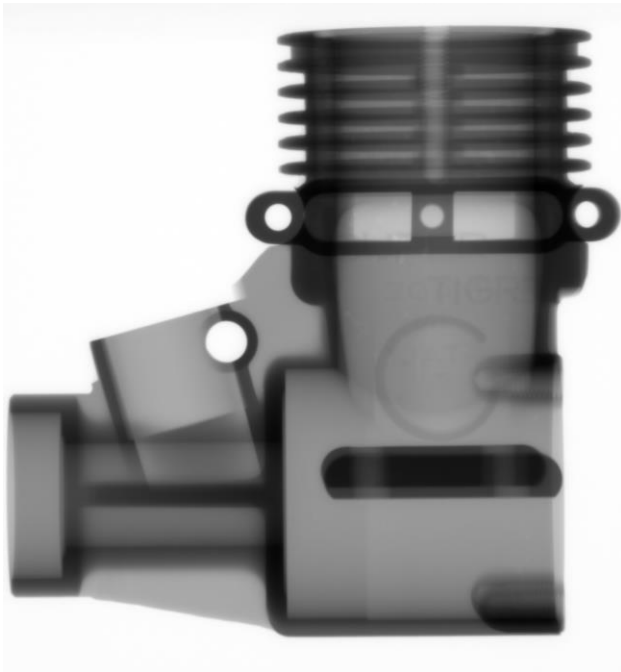


無人機引擎設計

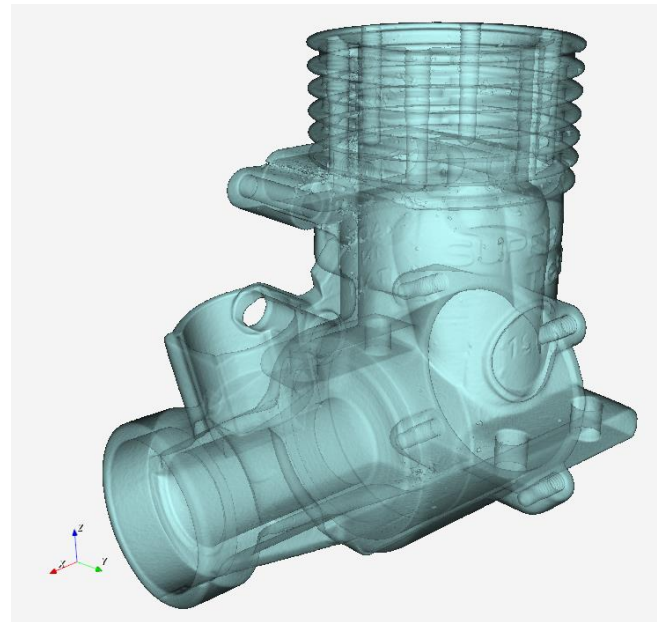
使用設備：



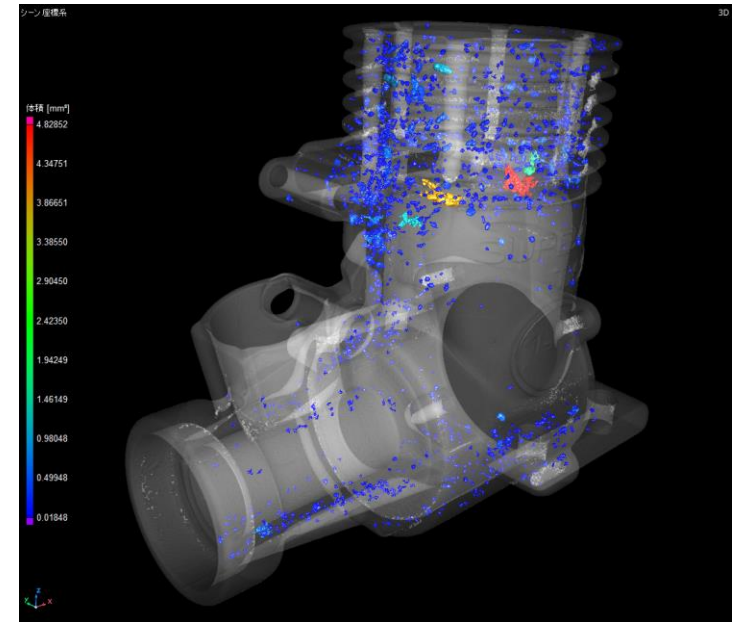
Xseeker8000



2D透視影像



3D VR模擬影像



欠陷解析

機車方向燈

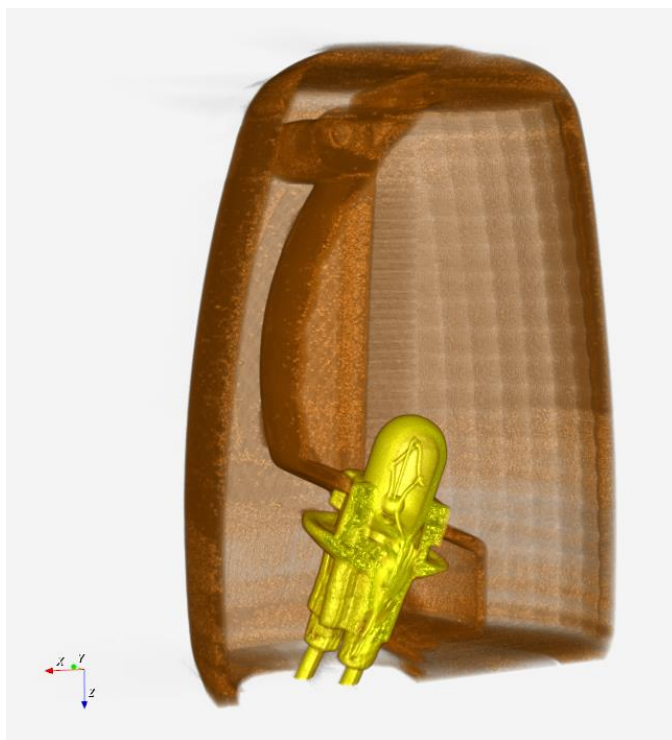
使用設備：



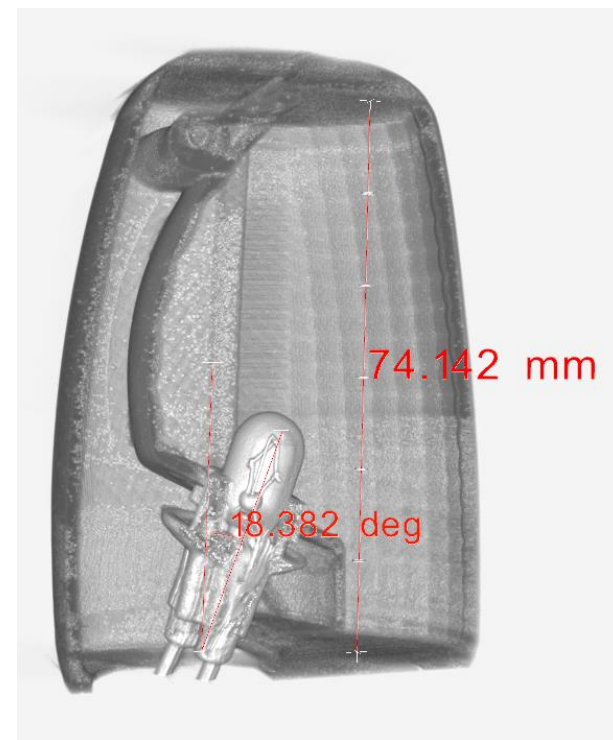
Xseeker8000



2D透視影像



3D VR模擬影像



3D VR(尺寸量測)

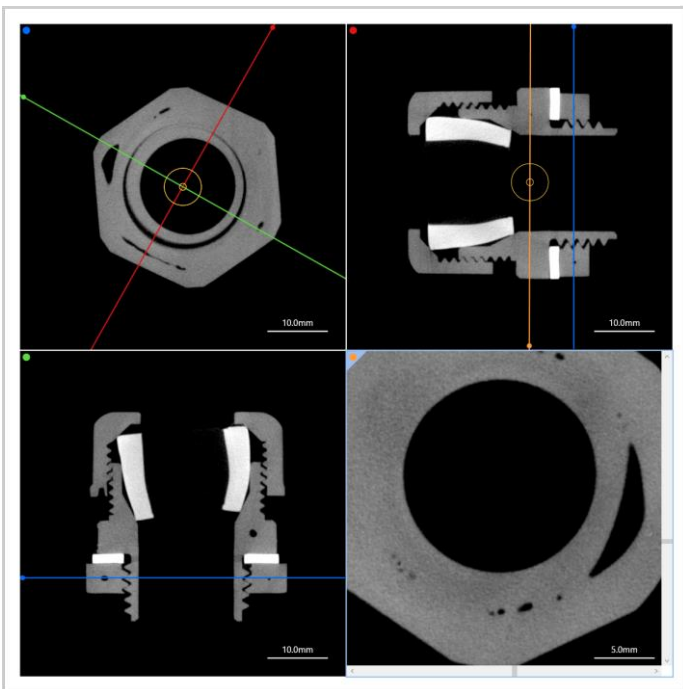


大型纜線接合器

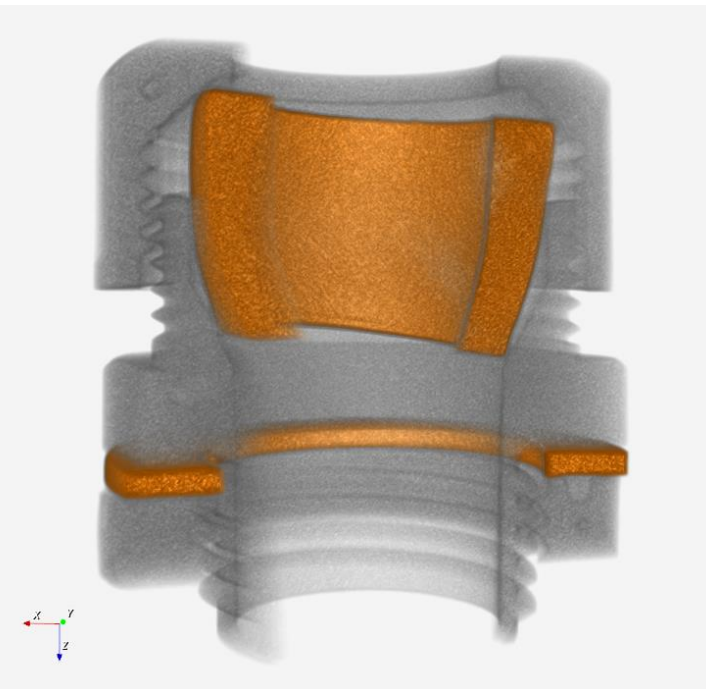
使用設備：



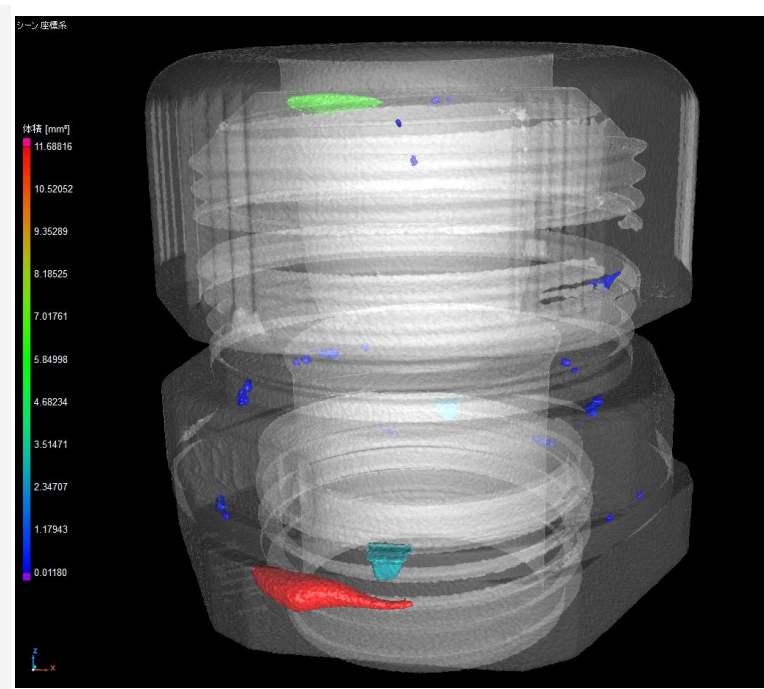
Xseeker8000



断面影像



3D VR模擬影像



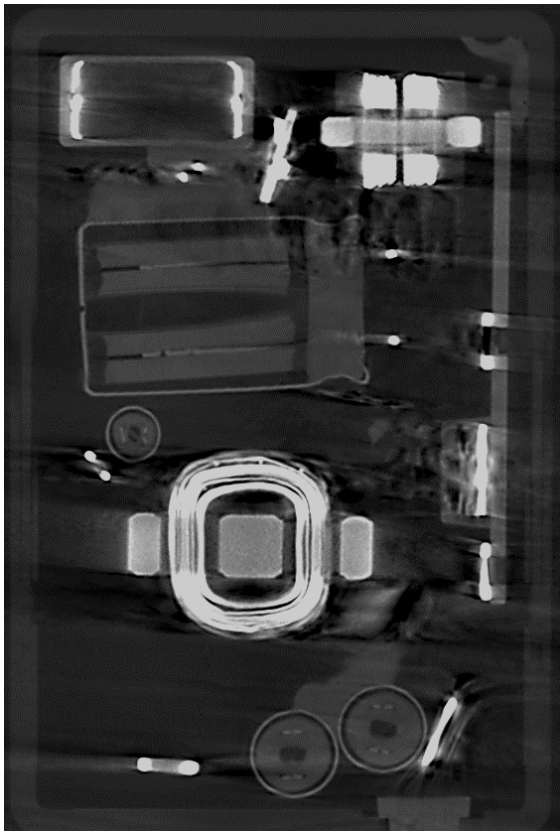
缺陷解析(VGSTUDIO MAX)

AC接合器

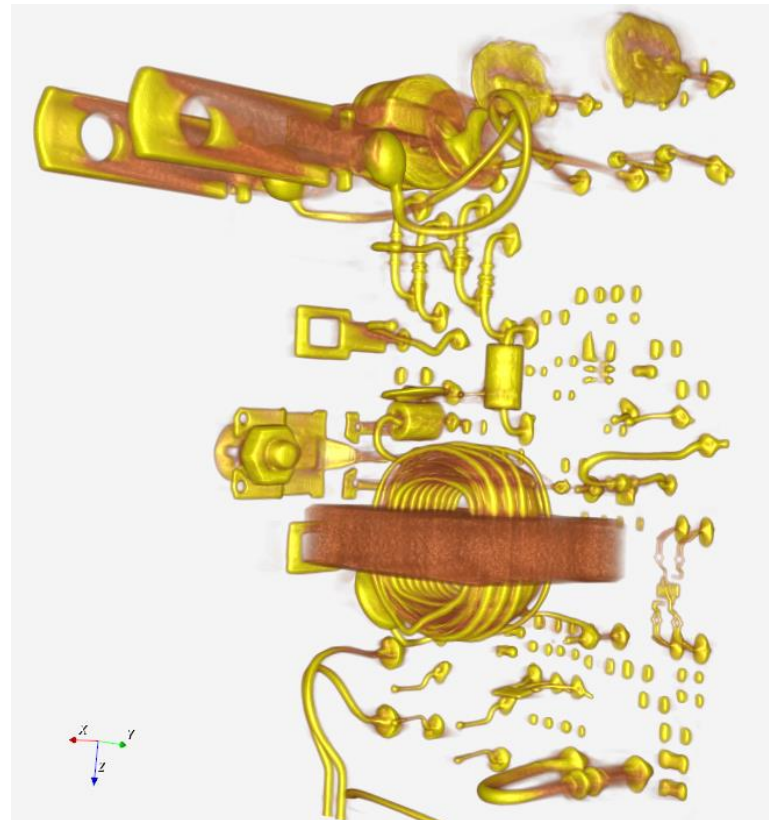
使用設備：



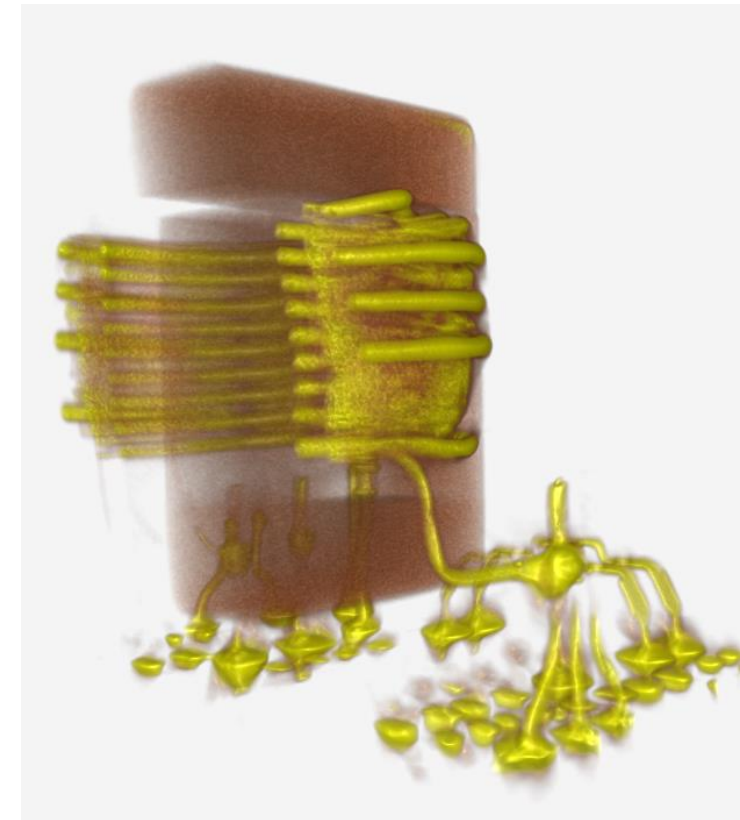
Xseeker8000



断面影像

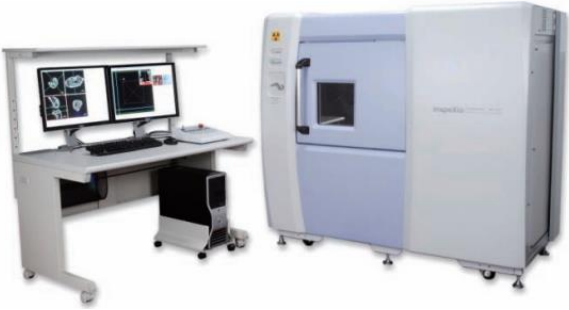


3D VR模擬影像

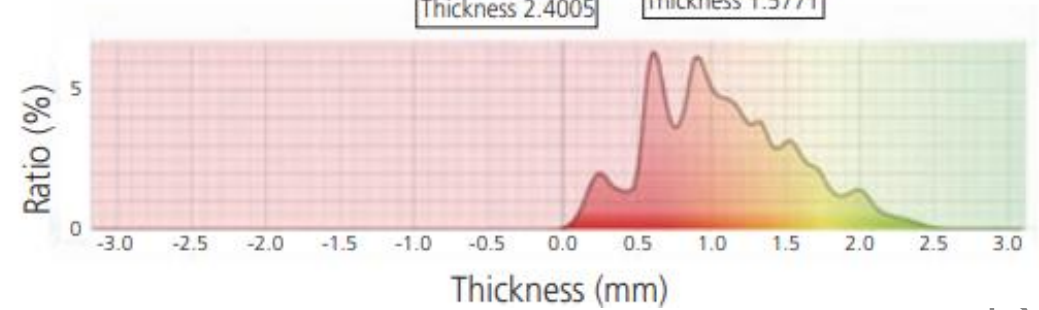
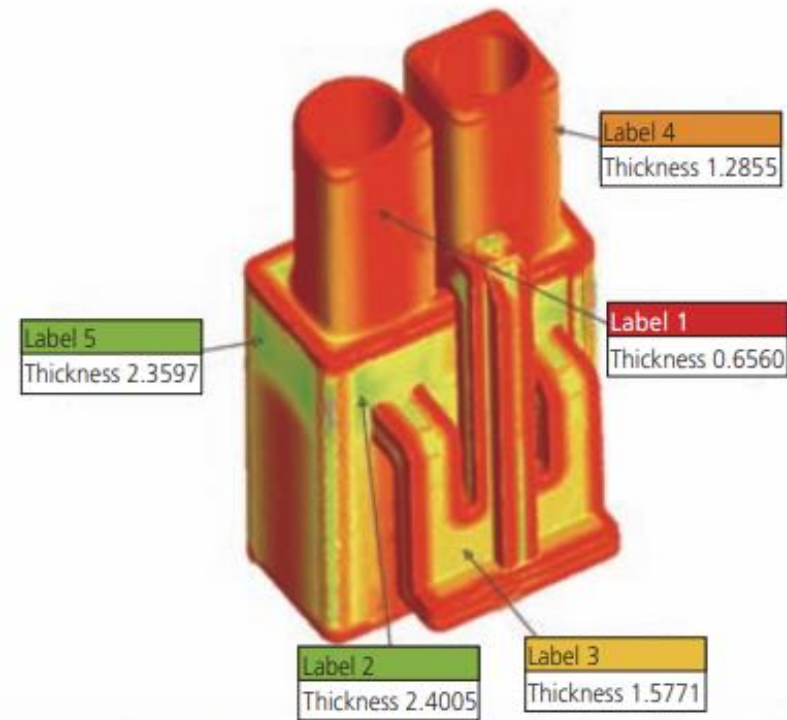
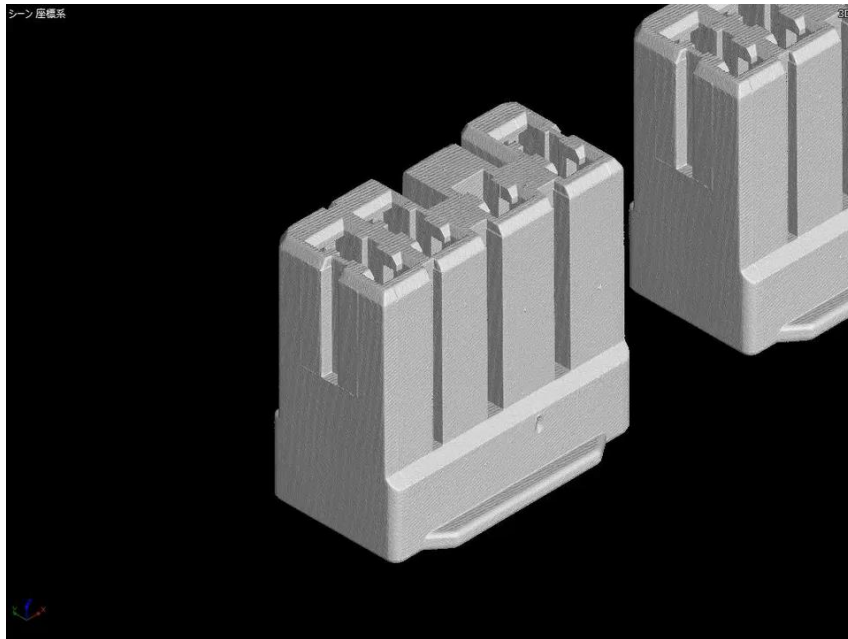


3D VR(核心部分)

模組聯接頭



SMX-100CT plus

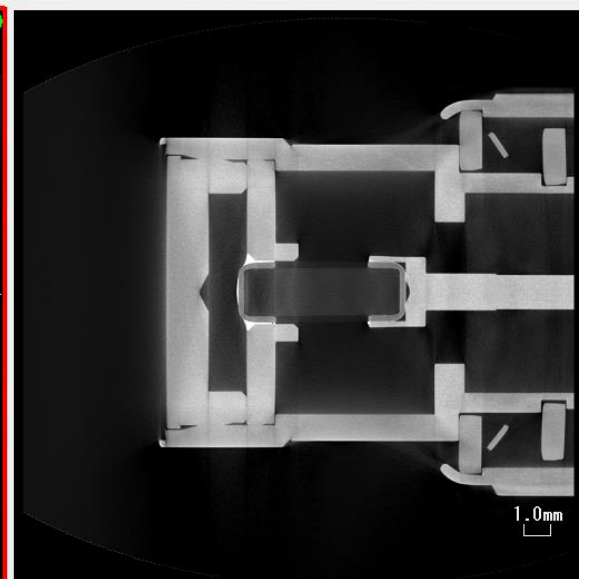
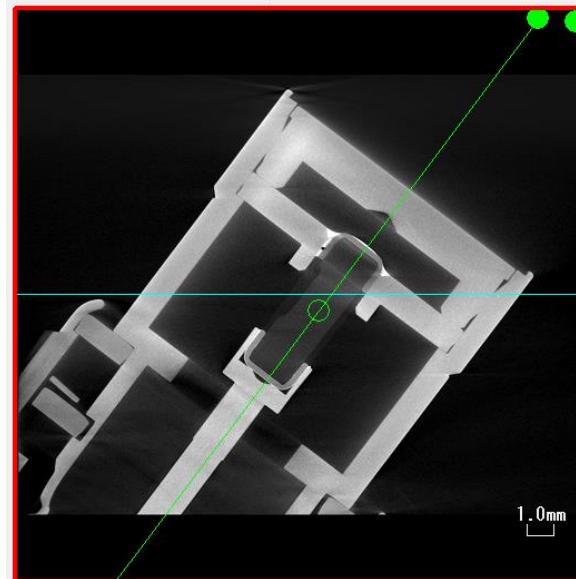
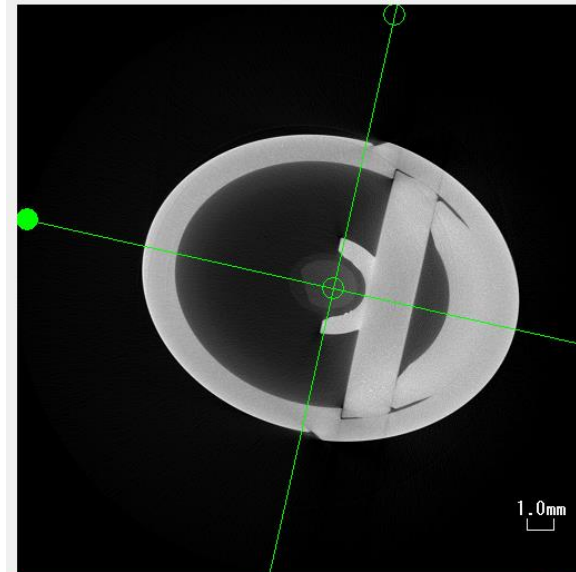
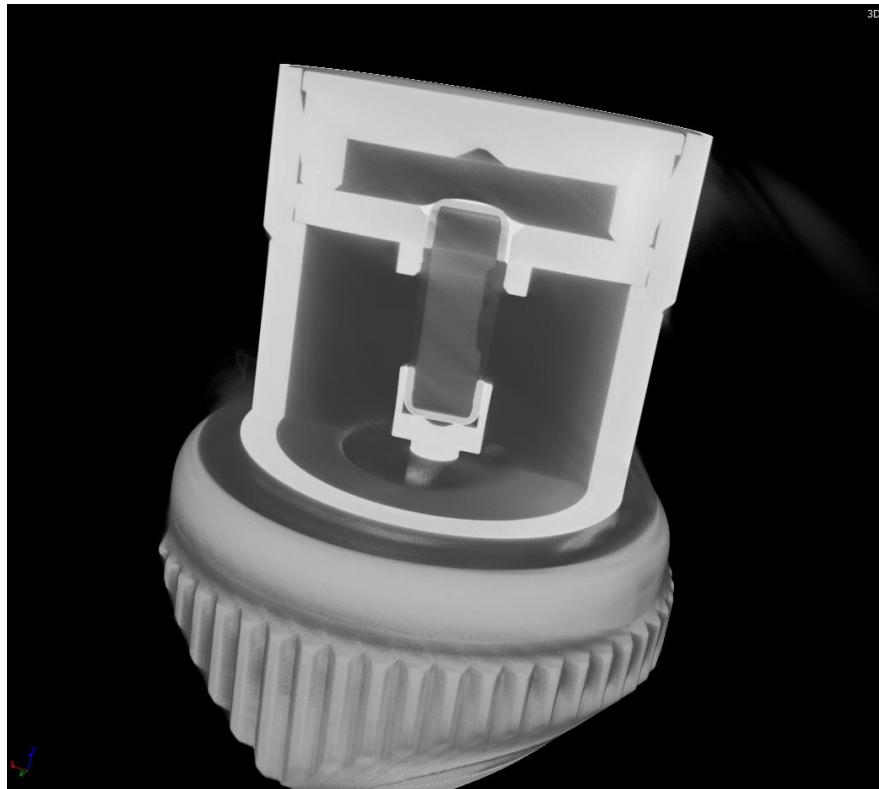


連接器

使用設備：



inspeXio™ SMX-225CT FPD HR Plus

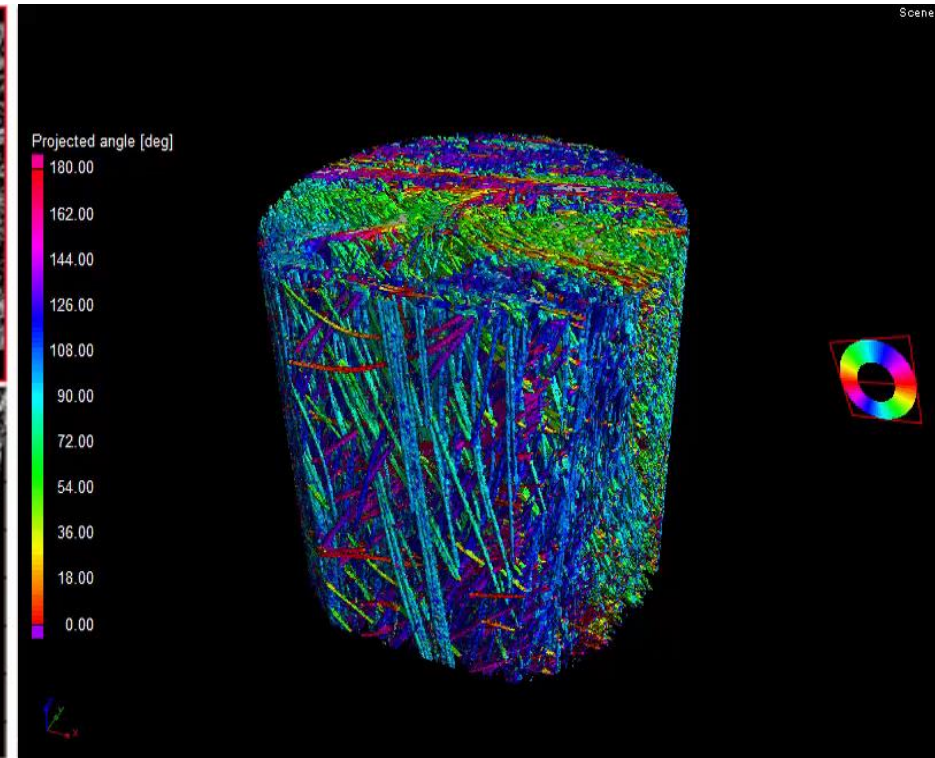
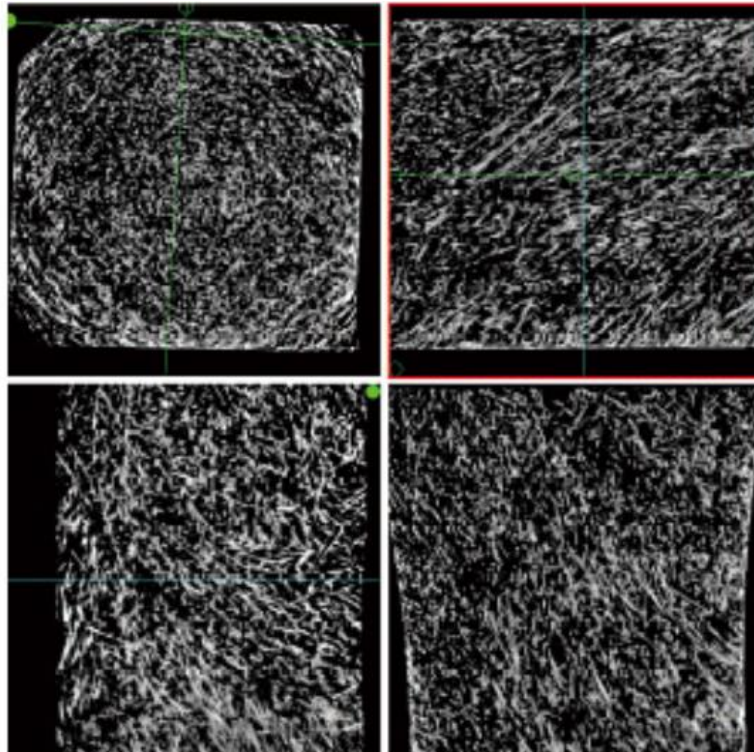
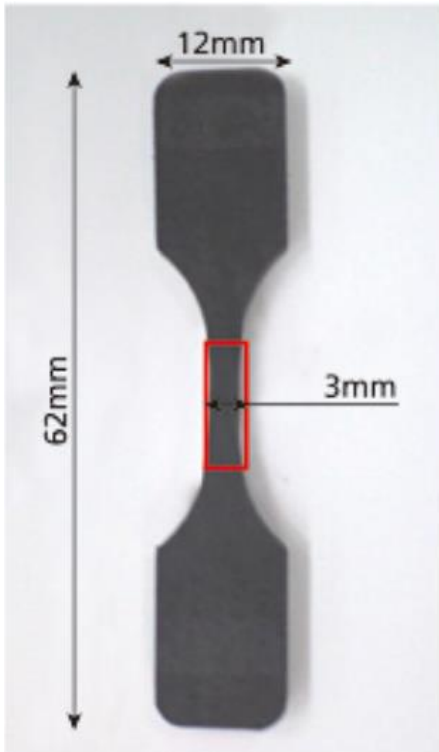


GFRP玻璃纖維強化塑膠

使用設備：



inspeXio™ SMX-225CT FPD HR Plus



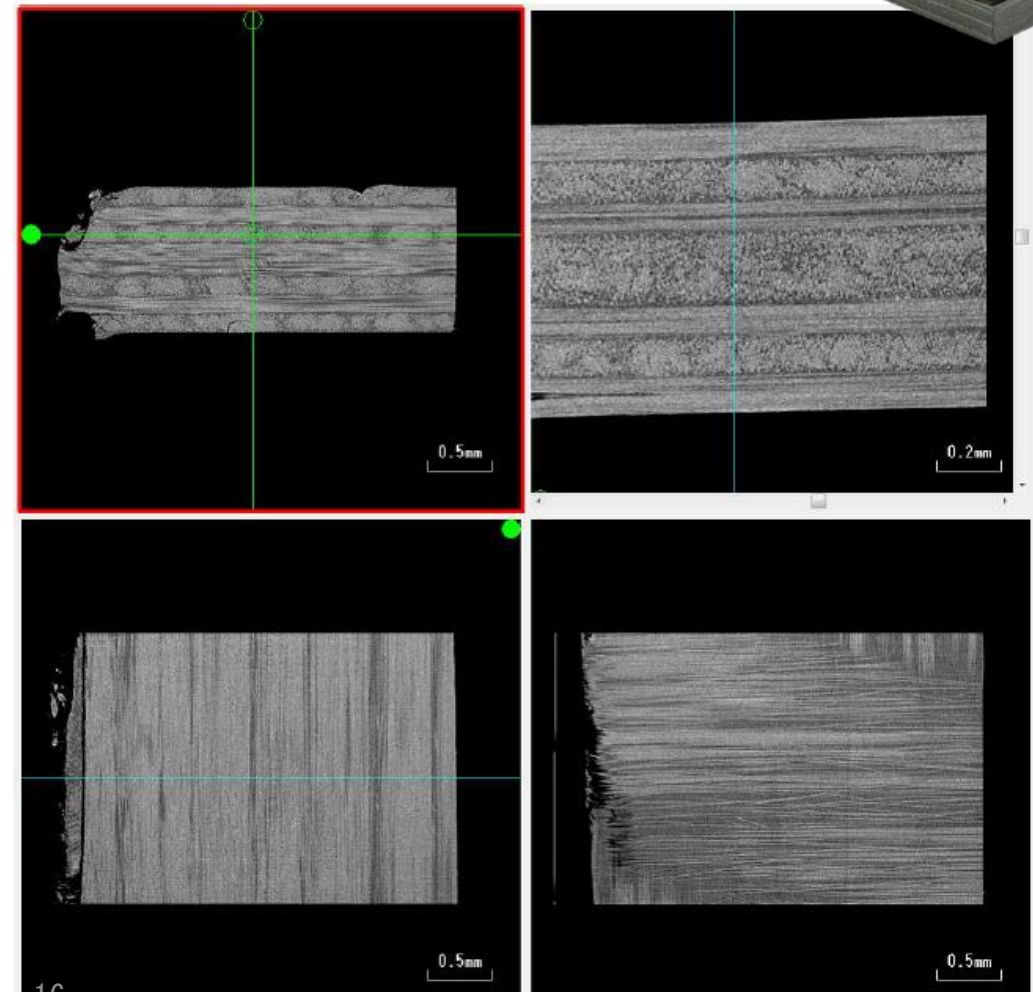
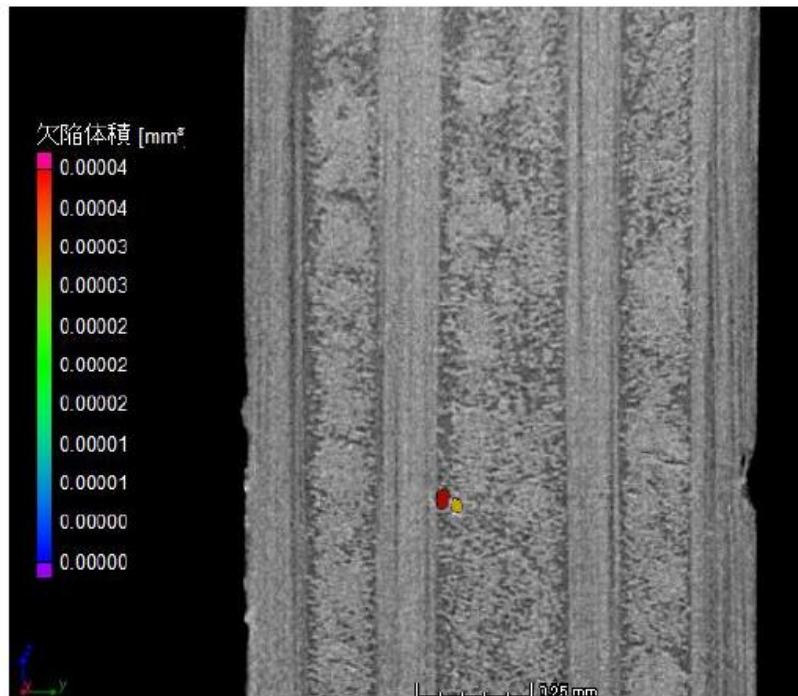
CFRP 碳纖維強化聚合物

使用設備：

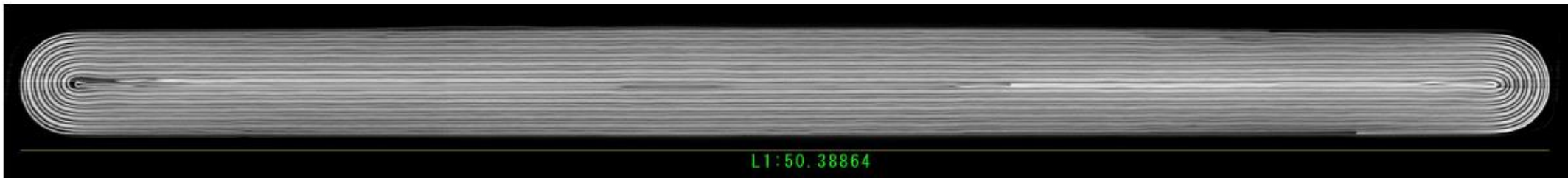


inspeXio™ SMX-225CT FPD HR Plus

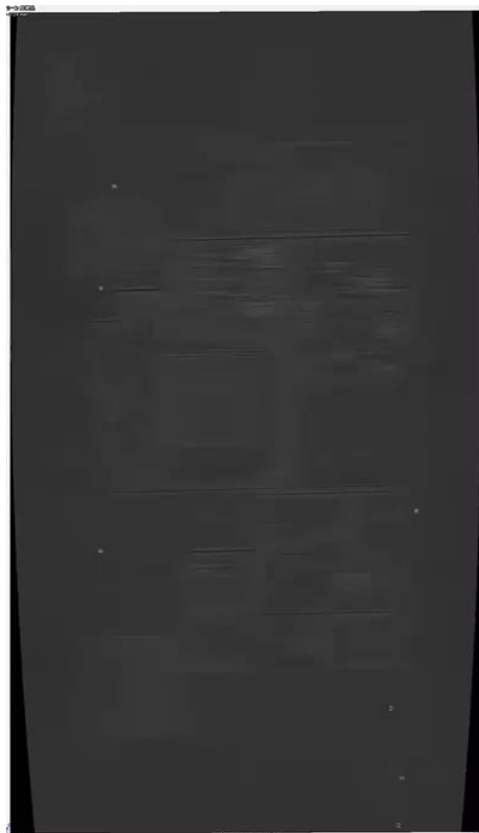
欠陥検出モジュールによる解析



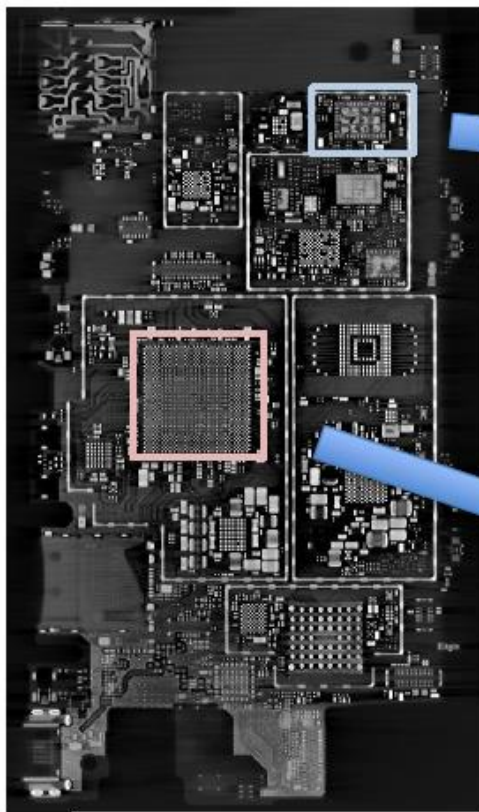
手機內部結構觀察 (電池/基板)



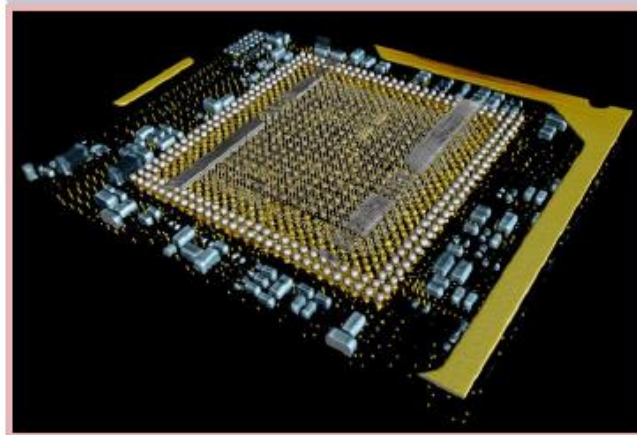
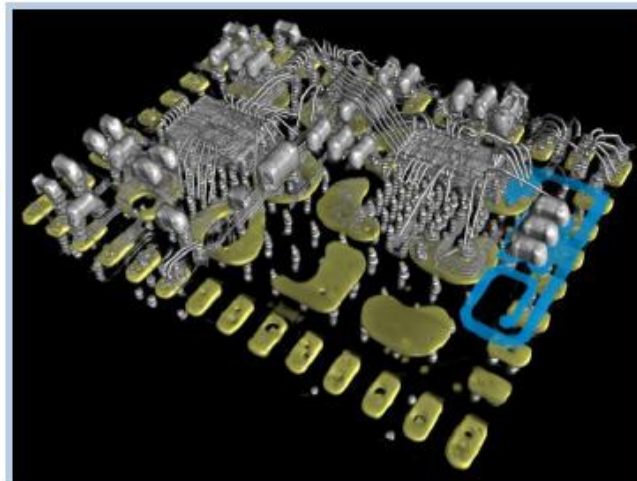
バッテリー断面画像



基板透視画像



基板オブリーク画像



電池觀察

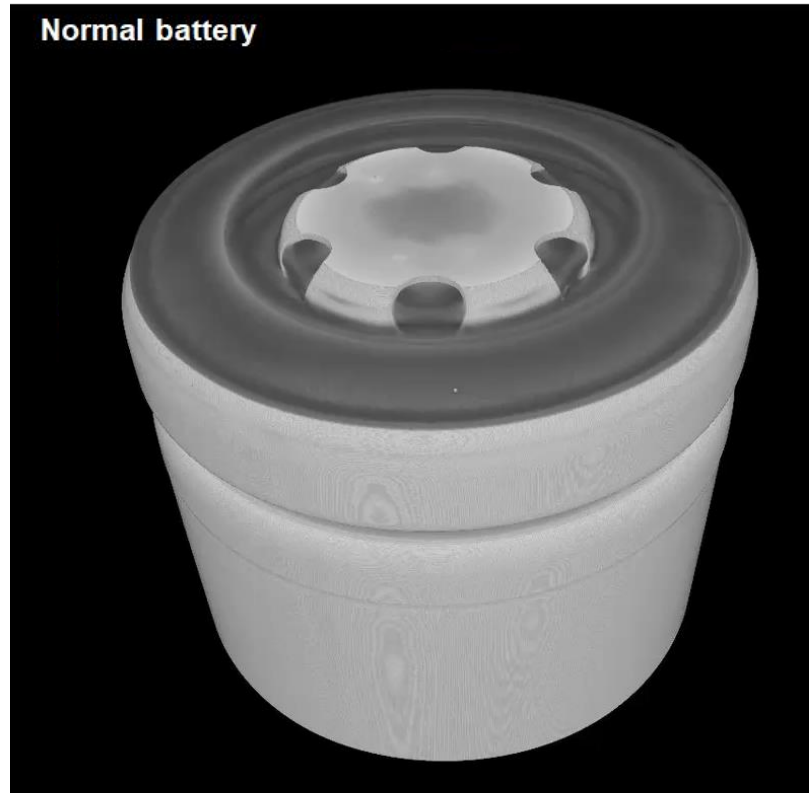
使用設備：



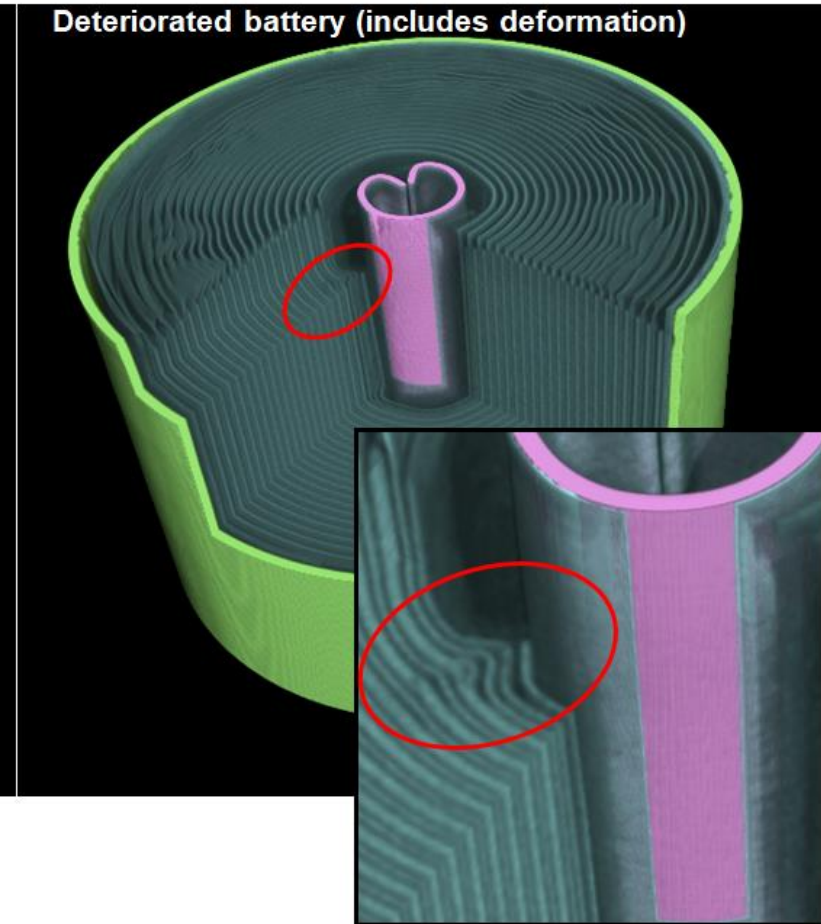
inspeXio™ SMX-225CT FPD HR Plus



Normal battery



Deteriorated battery (includes deformation)

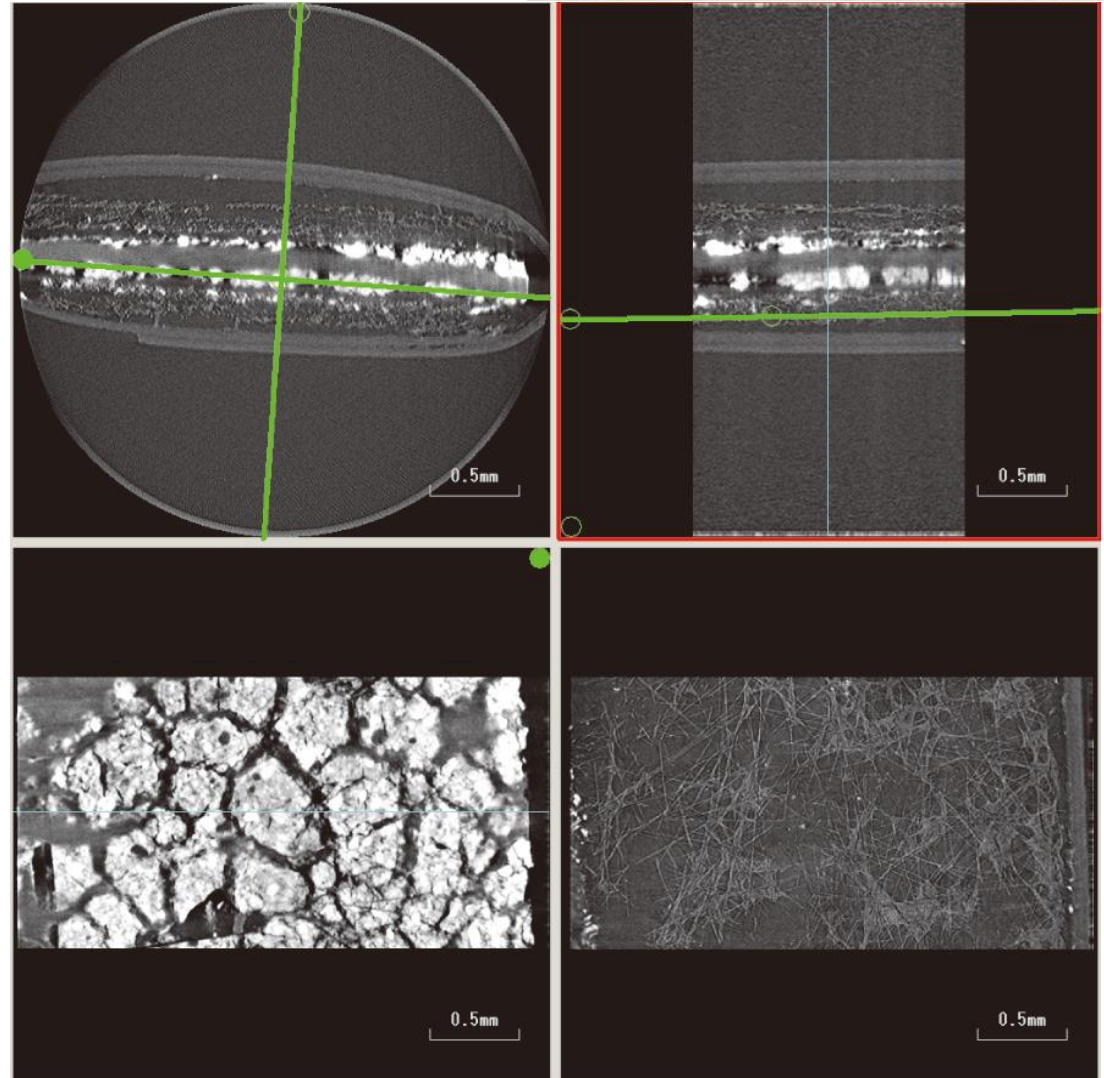
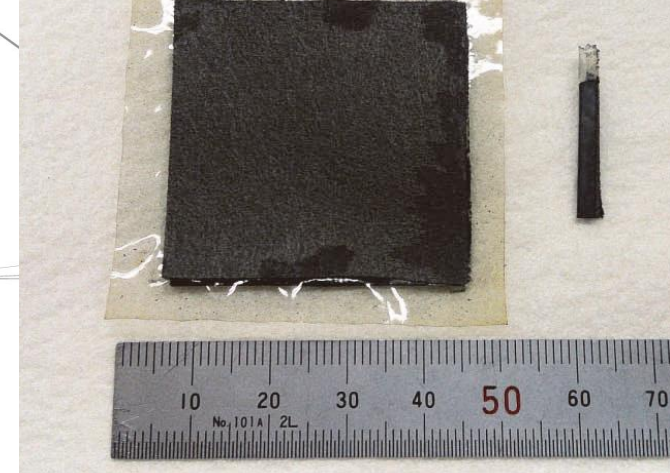
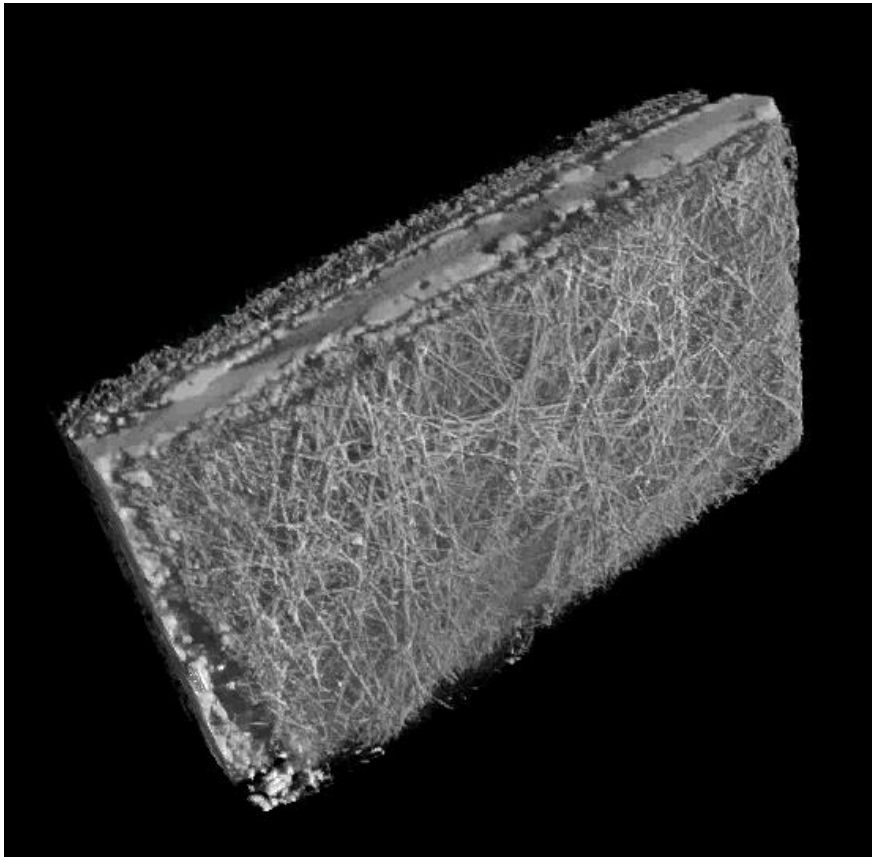


MEA燃料電池觀察

使用設備：



inspeXio™ SMX-225CT FPD HR Plus

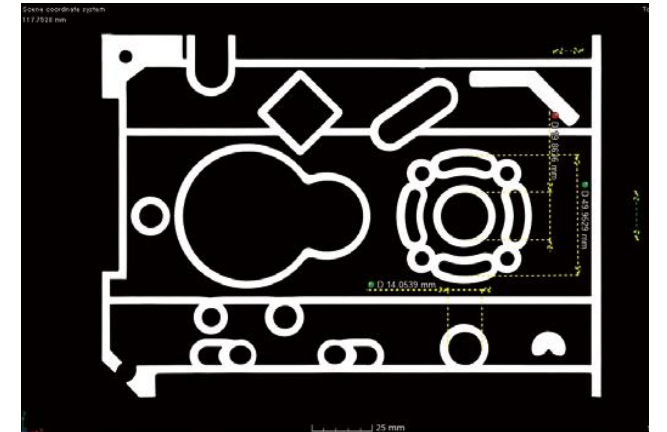
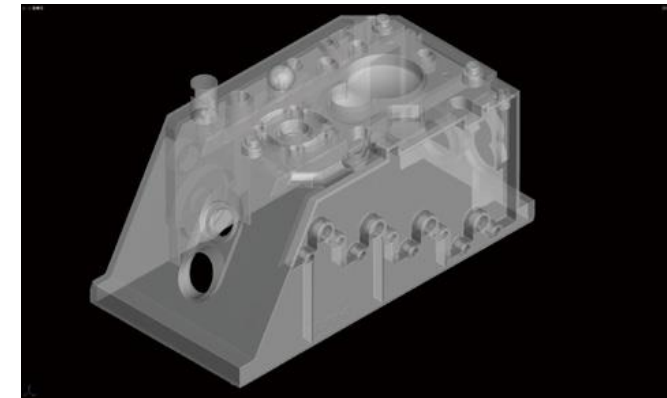
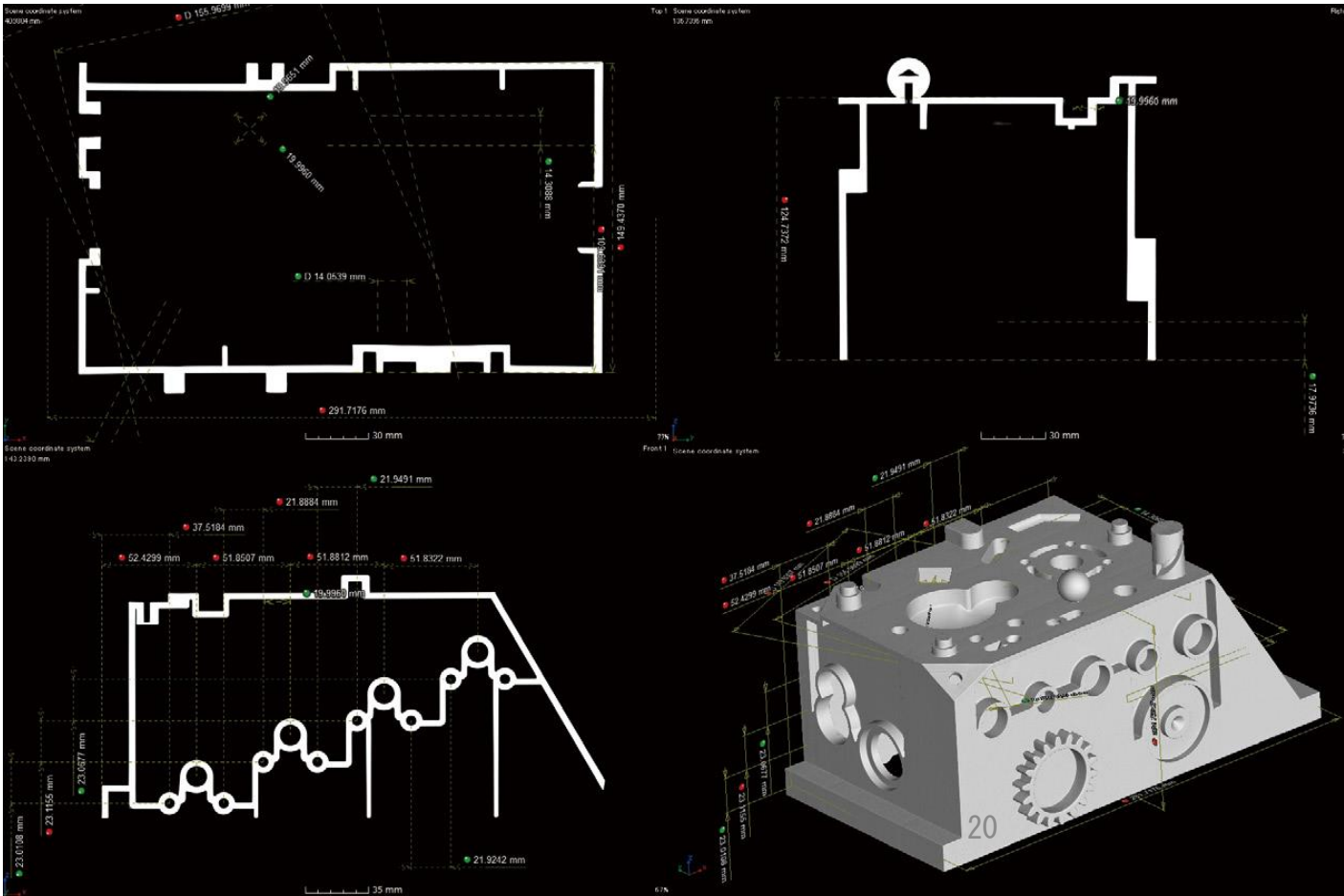


量測模具各別尺寸

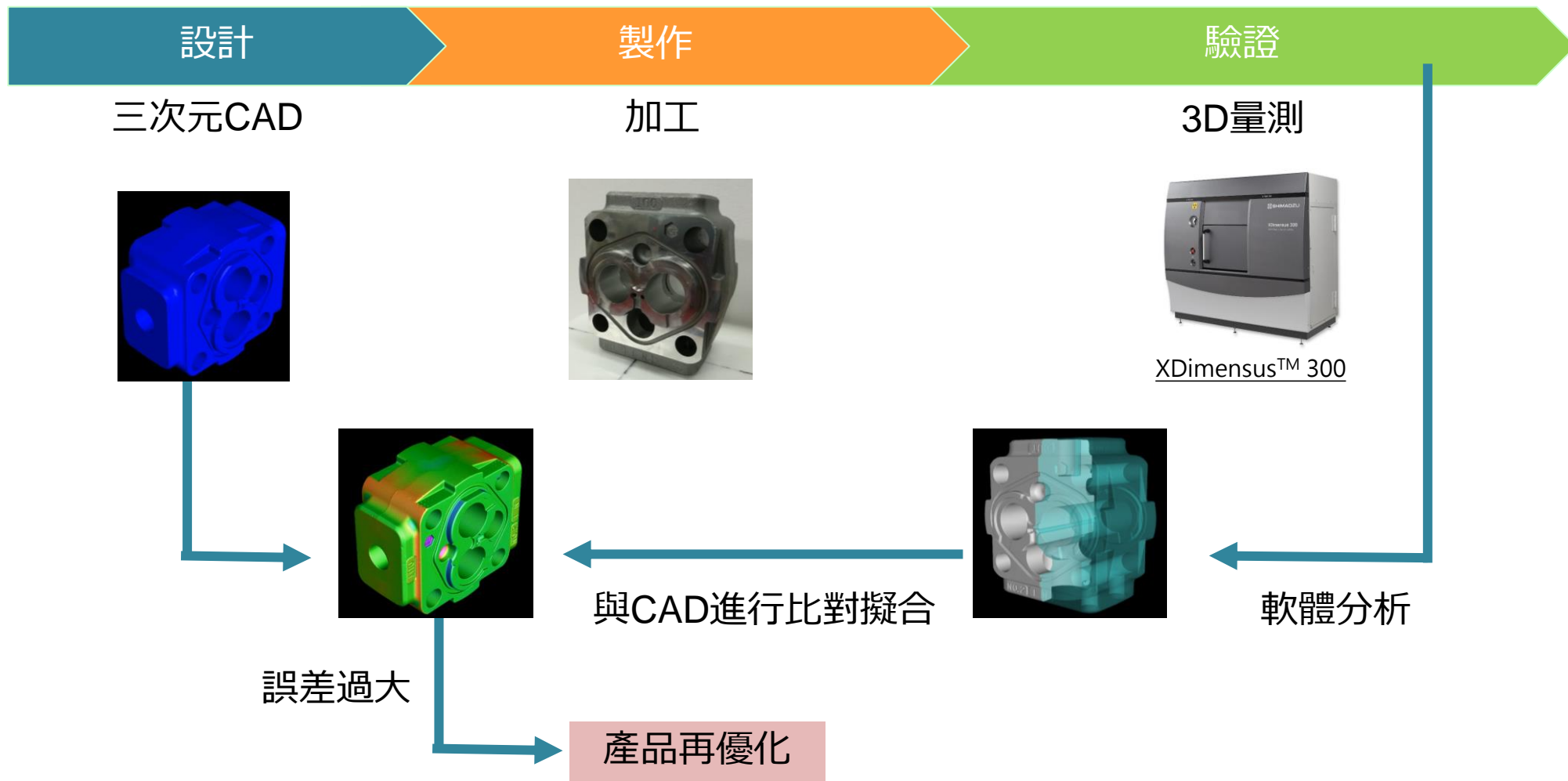
使用設備：



XDimensus™ 300



結合CAD與X-ray CT



無論內外尺寸都能進行比對

SHIMADZU - X射線檢查裝置的Lineup

2D X-ray system



Xslicer™ SMX™ -6010



SMX -1000 Plus

SMX -1010 & 1020

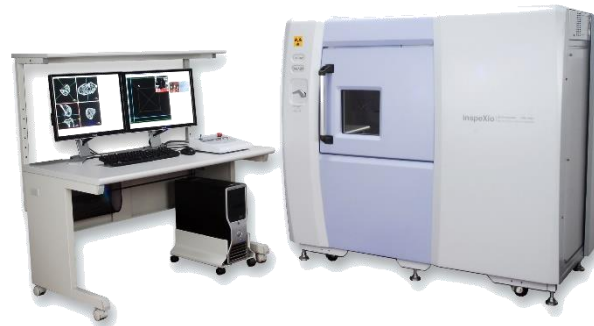
3D X-ray CT system



Xseeker8000



inspeXio™ SMX-225CT FPD HR Plus



inspeXio SMX-100 CT Plus



XDimensionus™ 300



THANK YOU

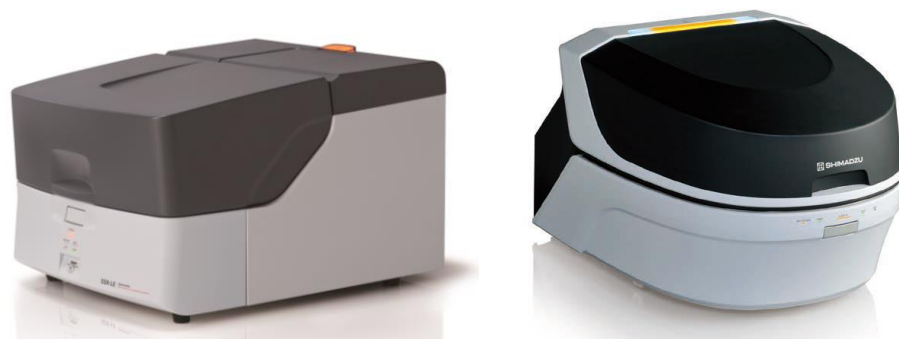
萬能試驗機



氣層析儀器



元素分析儀器(RoHS/成分分析)



天枰



紅外線光譜儀

