X-MET8000 Expert

OBJECTIVES

| Analyse and characterise artefacts or objects.
| Answer curatorial and conservation questions.

RESULTS

| Ability to conduct analyses in-house.
| Assess collections in a more in-depth way.
| Accurately document and compare materials.
| Identify further research needs.

Understanding history: Non-destructive elemental analysis of artefacts and works of art at the Ashmolean Museum, Oxford

Founded in 1683, the Ashmolean was Britain's first public museum. It was initially the home of a collection of miscellaneous manmade and natural specimens and curiosities from every corner of the world, which was presented to the University by the wealthy antiquarian and polymath, Elias Ashmole. The museum was re-named the 'Ashmolean Museum of Art and Archaeology' in 1908 and it has since grown to become one of the most important museums of art and archaeology in the world.

When acquiring new items, collections or studying existing ones, the museum's conservation departments use a variety of techniques to analyse and characterise artefacts or objects, including X-ray fluorescence (XRF).

Dr Kelly Domoney, Objects Conservator at the Ashmolean Museum, University of Oxford, and Research Fellow at Cranfield University, UK, uses Hitachi High-Tech's X-MET8000 Expert on a regular basis in the investigation and characterisation of materials in the Ashmolean's collection. Using a handheld XRF analyser for archaeometry, conservation and restoration applications provides a fast and portable solution to non-invasive and non-destructive analysis.

> **The portability and non-destructivity of the technique is essential to the analysis work at the museum. The ability to conduct analyses in-house means that a broader range of research projects can now take place.**

The X-MET helps to answer curatorial and conservation questions on manufacturing materials and techniques, provenance and dating, identification of restoration materials, authentication studies, and characterisation of corrosion processes.

EXAMPLES OF APPLICATION

Analysis of Renaissance Dutch Silver in the Wellby Collection:
This project aimed to identify the purity of silver used in the manufacture of pieces in the collection and to identify restored sections. Initial results show that restored areas are easily identified by the presence of chromium, iron and lead. The results were used to prepare the catalogue entries for an exhibition.

Analysis of Worcester porcelain: The instrument was used to characterise the coloured glazes on Worcester porcelain to help determine authenticity. Many 18th century Worcester pieces were known to have been redecorated in the 19th century. Identification of 19th century pigments such as chromium green and high zinc yellows can help curators to date the pieces more accurately. The results are being used to inform the entries on a new collection's catalogue.

Analysis of Meissen porcelain: Porcelain was first produced in Germany at the Meissen factory in 1710. The Ashmolean has one of the very early pieces from the factory, a large tea or coffee pot dating to 1719-1722. The lid and spout are of a different colour and form and appear to have been replaced. A comparison with the X-MET database of Meissen glazes developed by Kelly Domoney at Cranfield University indicated that the spout is composed of a similar material to the main body of the teapot and was replaced sometime between 1719 and 1725, whereas the lid is made from a completely different glaze material and is a much later replacement.

DEMONSTRATING VALUE

Dr Domoney says: "The portability and non-destructivity of the technique is essential to the analysis work at the museum. Many objects are immovable and the insurance costs involved in taking objects to a laboratory are often prohibitive. The ability to conduct analyses in-house means that a broader range of research projects can now take place. In the past, the characterisation of materials and identification of corrosion products was often done by eye. The X-MET enables us to assess collections in a far more in-depth way, meaning that we can accurately document and compare materials in the collections, and identify further research needs."

If you'd like to see the X-MET8000 analyser in action visit www.hitachi-hightech.com/hha or book a demo.

X-MET8000 SERIES

Our range of handheld XRF analysers, the X-MET8000 series, delivers the speed and performance required even in the most demanding applications. Suitable for all analysis needs from scrap metal analysis, precious metals and jewellery analysis to positive material identification (PMI) for inspection and manufacturing applications, and regulatory compliance screening.

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