

DAY 1 April 10, 8:30am—5:30pm

7:30am Bus departs from 8th & G Street entrance of the Smithsonian American Art Museum (SAAM) for Steven F. Udvar-Hazy Center

*Note: All meetings, lectures and breaks take place in classroom 2A.
Coffee, doughnuts and lunches are generously sponsored by Bruker Analytical.*

8:30–9:00am Introductions & Getting Started

9:00–10:30am MODULE 1: Guided Visit of the Emil Buehler Conservation Laboratory and the Mary Baker Engen Restoration Hangar

Malcolm Collum, Chief Conservator, Emil Buehler Conservation Laboratory at the National Air and Space Museum

The visit explores the facilities and provides an overview of the history of aluminum treatments on large-scale artifacts at NASM. Discussions include evolving philosophical approaches towards preservation, environmental restrictions on established treatment methodologies, and challenges for the conservation of aluminum in museum collections.

10:30–11:00am Coffee Break

11:00am–1:00pm MODULE 2: Finishes and Surface Treatment of Aluminum Alloys

David Hallam, Coordinator of the ICOM-CC Metal Working Group and Metallic Heritage Consultant in Tasmania, Australia

This module explores the surface of aluminum alloys and identifies chemical treatments and finishes applied to aluminum, including those applied for aesthetic as well as anti-corrosion properties. This introduction includes a review of approximately 20 historic coatings, from various countries, and the potential impact of treatment on these finishes. A study of representative examples with hands-on testing and analysis will familiarize attendees with different materials, modes of deterioration, and typical treatment methods on artifacts.

LEARNING OUTCOMES

- Identify basic aluminum coating types
- Understand the effects of different surface treatments on stability
- Understand the effects of aggressive intervention on the surface of aluminum
- Implement strategies to conserve original surfaces on aluminum

1:00–2:00pm Lunch

2:00–4:00pm MODULE 3: Practical Application of Surface Washing, Surfactants, and Corrosion Inhibitors for the Corrosion Prevention of Aluminum Alloys

Dr. Bruce Hinton, Adjunct Professor, Corrosion Science, Monash University, Australia

This module focuses on corrosion of aluminum alloys. Bruce Hinton has spent a long career developing strategies and procedures mitigating corrosion on military aircraft structures, which he will share with participants. The presentation will cover various methods of preventing, treating and removing corrosion, including protective coatings, washing, use of corrosion inhibiting compounds and dehumidification, as well as techniques for measuring surface salt contamination.

LEARNING OUTCOMES

- Identify the various types of corrosion common to aluminum alloys
- Understand how protective coatings work and fail
- Understand methods of corrosion removal
- Identify methods to arrest existing corrosion without total removal

4:00–4:30pm Wrap-up and Discussion

4:30–5:30pm Free Time for Museum Visit

5:15pm Bus departs for SAAM, Washington, DC

DAY 2 April 11, 8:30–12:30 pm

7:30am Bus departs from 8th & G Street entrance of the Smithsonian American Art Museum (SAAM) for Steven F. Udvar-Hazy Center

8:30–9:00am Coffee and Doughnuts

9:00am–12:30pm MODULE 4: Challenges and Advantages of Using Portable XRF for Low Mass Elemental Analysis in Both Metal Alloys and Oxide Forms, and Portable FTIR for Analysis of Molecular Structure

Dr. Bruce Kaiser, Chief Scientist, Bruker Elemental, U.S.A., in collaboration with conservators from the National Air and Space Museum

In this module participants learn about identification and the analysis of the molecular structure of aluminum corrosion products. Bruker will provide several handheld XRF and FTIR devices for hands-on testing. Participants are invited to bring test samples for XRF and FTIR analysis. Previous experience with XRF required.

LEARNING OUTCOMES

- Understand the principles of XRF and FTIR analysis
- Select correct filters, voltage and current for optimum XRF analysis of aluminum alloys
- Identify the factors affecting aluminum analysis
- Perform hands-on analysis of aluminum alloy samples using XRF and FTIR techniques
- Master the interpretation of data

12:00–12:30pm Wrap-up and Discussion

12:45–1:45pm Lunch

2:00pm Bus departs for SAAM, Washington, DC