



Steinler

RECOVER



Cleaning detail
Courtesy MNH

“CONSERVATION-RESTORATION REQUIRES A HOLISTIC APPROACH”

For years, D^r Balázs Lencz of the Hungarian National Museum has championed the concept of “eco-restoration”, a practice that benefits artworks, the environment and people alike. Here, he discusses the European GREENART project and its key challenges.

As Head of the Conservation and Restoration Department at the Hungarian National Museum (HNM), D^r Balázs Lencz stands out as a leading figure in the field of metal restoration and the preservation of delicate lacquer objects. His expertise is reflected in numerous scientific publications on Japanese art and its conservation techniques. But his role as Chief Conservator goes beyond safeguarding artworks. He is equally committed to protecting museum staff, who often face exposure to harmful substances during preventive conservation or restoration activities.

D^r Lencz is also deeply concerned with the disposal of chemical waste generated during restoration processes. The Hungarian National Museum, where he works, has earned a reputation as a trailblazer in “green conservation”, a practice that safeguards both people and cultural heritage. Today, the Budapest-based institution is recognised as a European leader in the field and plays an active role in GREENART, an EU-funded project exploring innovative, eco-friendly materials and sustainable methods for preserving, conserving and restoring cultural heritage. D^r Lencz shares insights into the ongoing case studies, his involvement and the challenges the project faces.

How did the Hungarian National Museum and yourself become involved in the GREENART project? What drew you to it?

Over the past few decades, our institution has focused on replacing harmful and toxic materials used in conservation with safer alternatives.

Previously, we were part of the APACHE project,

which developed smart, active packaging materials and display cases. [This was another Horizon-funded EU project, completed in 2022, which introduced new tools to monitor and prevent the degradation of artworks caused by unstable climatic conditions, light and pollution, editor’s note] Through this experience, we built strong connections with research institutions and museum partners, which eventually led us to join GREENART. The issues addressed by GREENART are critical for the conservation field. Over the years, we have identified serious health problems among conservators, often linked to exposure to toxic materials. Initially, our goal was to replace these substances to protect our staff — particularly those working directly on objects — and to develop new solutions that shield them from solvents, coatings and other harmful chemicals. We are honoured to participate in GREENART. Conservation is often underrepresented in cultural communication, so this project gives us the opportunity to showcase the work of conservation

and engage with society on a broader scale — not just the general public, but also stakeholders and policymakers. If we want to provoke a significant shift in thinking, we must start with decision-makers, convincing them of the importance of conservation and environmentally friendly approaches. The research results from this project provide evidence that can help them support these changes financially and politically

You mentioned health issues among staff members. Could you provide examples? Are we talking about allergies or respiratory problems?

Without going into specific cases, I can say that we have observed respiratory problems caused by exposure to harmful solvents. When working on small objects, we do not use large quantities of these substances. However, for larger projects — such as chandeliers, cars or industrial heritage objects — we end up using much more toxic materials. That is when alternatives really need to be considered. Of course, we use protective equipment, such as masks, to safeguard respiratory health. But there are situations where it is not possible to wear them or to keep them on all day. This is why it is essential to reduce the impact on our staff, the objects themselves and the environment. Additionally, many people do not realise that conservation work generates a significant amount of waste. When we use acids and bases, we try to neutralise them before disposal, but we still feel uneasy about their environmental impact.

Which Work Packages within the GREENART project are you most involved with?

Conservation requires a holistic approach — everything is interconnected. That is why we are involved in Work Packages 2, 3, 4 and 5, as well as dissemination activities. We work with solvents,

coatings, consolidation materials and packaging materials. We also use sensors in our storage areas to monitor conditions both inside the museum building and in external storage facilities. It is a very complex system that we are currently renewing, so the project is extremely valuable to us.

What types of products are you currently testing?

Since we are involved in several Work Packages, we are working on multiple fronts. We are testing solvents, various gels and combinations of gels and solvents, comparing them with traditional solutions and materials. We start with sample testing, but we have also proposed using real-life scenarios with authentic artworks. After the sample tests, we move on to testing these new materials on actual works of art, always with the utmost care. Recently, we received packaging materials for our case study objects, made from different materials. We are also participating in the measurement of volatile organic compounds (VOCs) emitted either by the objects themselves or by storage and exhibition materials. These harmful substances can originate from the objects due to their degradation or from the materials used in storage and exhibition setups. We aim to measure and compare them so that, together with our development partners, we can find effective solutions for long-term preservation. While standard storage boxes can sometimes be used, special objects often require customised storage solutions tailored to their specific needs.

Is it the same for transportation?

Yes, for both transport and storage. Another important aspect of this project is the development of new absorbents for VOCs — materials that can absorb harmful substances in the environment surrounding the objects.

You specialise in metal and lacquer objects. Do these present specific conservation challenges?

How might GREENART products address these issues?

Absolutely. GREENART has significant potential to protect these types of artworks. Japanese lacquer, which I have been studying for decades, is highly sensitive to fluctuations in humidity, dry environments and temperature changes. Proper storage is crucial for these objects. In Central and Eastern Europe, our climate differs from Japan's — it is drier and storage facilities often lack adequate equipment to maintain appropriate humidity levels. Suitable storage and packaging are essential. Even if the surrounding environment is not ideal, you can protect an object by creating optimal conditions inside its storage box. GREENART focuses on developing packaging materials that do not release harmful gases.

Can you tell us more about the artworks you are currently testing with GREENART products?

We have selected a diverse range of objects made from very different materials for our case studies. One notable example is the *Handstein*, a mining model created in Körmöcbánya or Selmecebánya (now in Slovakia) in the 18th century. It depicts a small hill with figurines illustrating all stages of the mining process. The object is composed of various minerals and crystals (pyrite, quartz, amethyst, etc.) and decorated with painted organic ornaments, all mounted on a gilded silver pedestal with lion-shaped feet at each corner. It is a rare and complex piece, a true masterpiece of craftsmanship, chosen for testing because of its heavily contaminated surface. Over the years, it has been treated multiple times with different materials — waxes, epoxies and more. It also shows signs of dirt and impurities that have darkened its appearance.

- Visual observations with microscope (completed with
- Observation and 3D documentation of surface charac
- Keyence digital microscope, before corrosive exposure

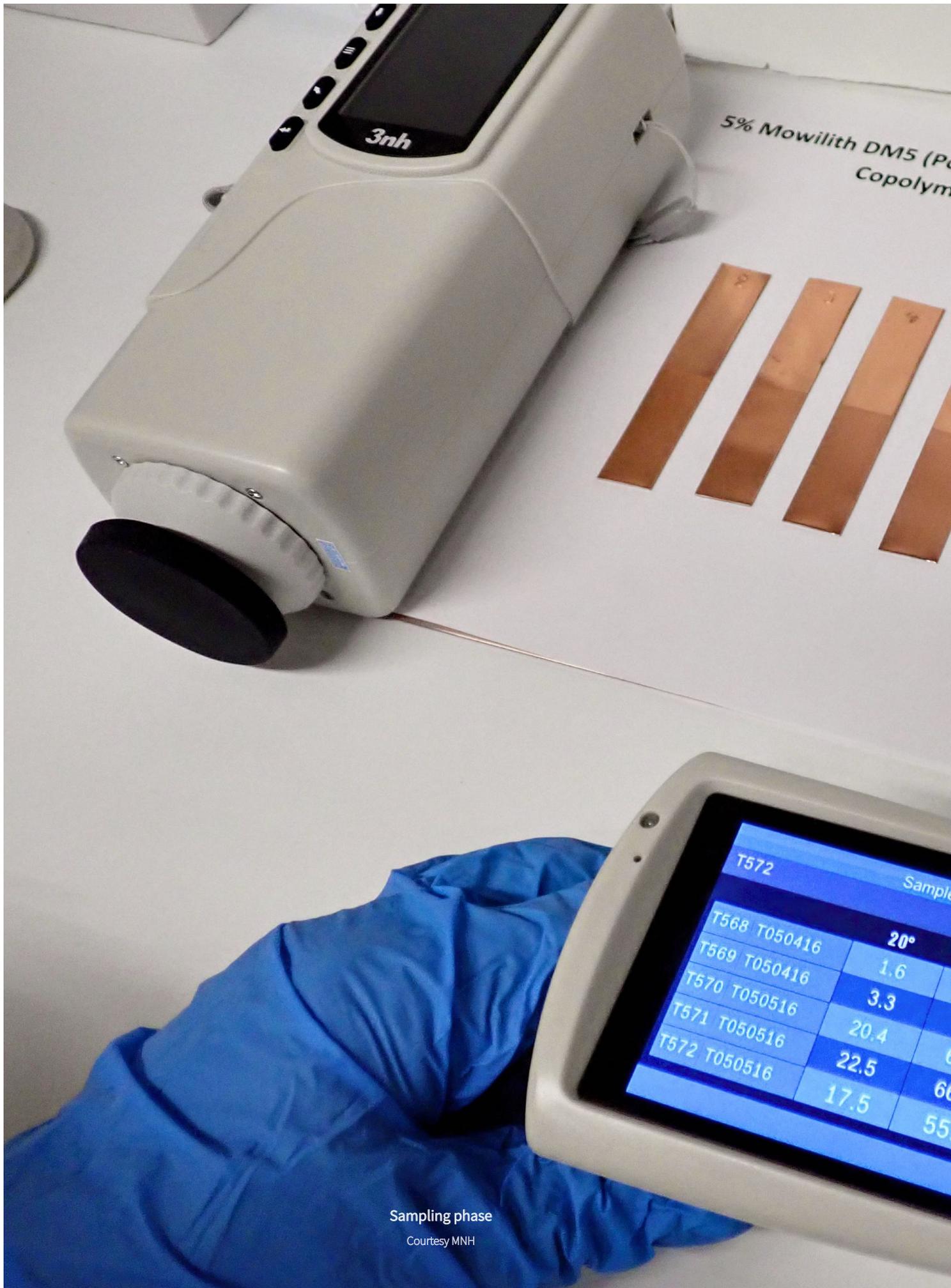


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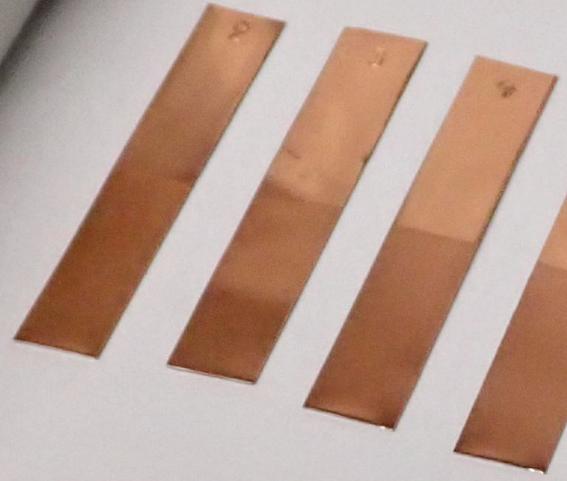


D^r Balázs Lencz during last GREENART presentation

Photo Pierre Naquin. © Art Media Agency



5% Mowilith DMS (P
Copolym

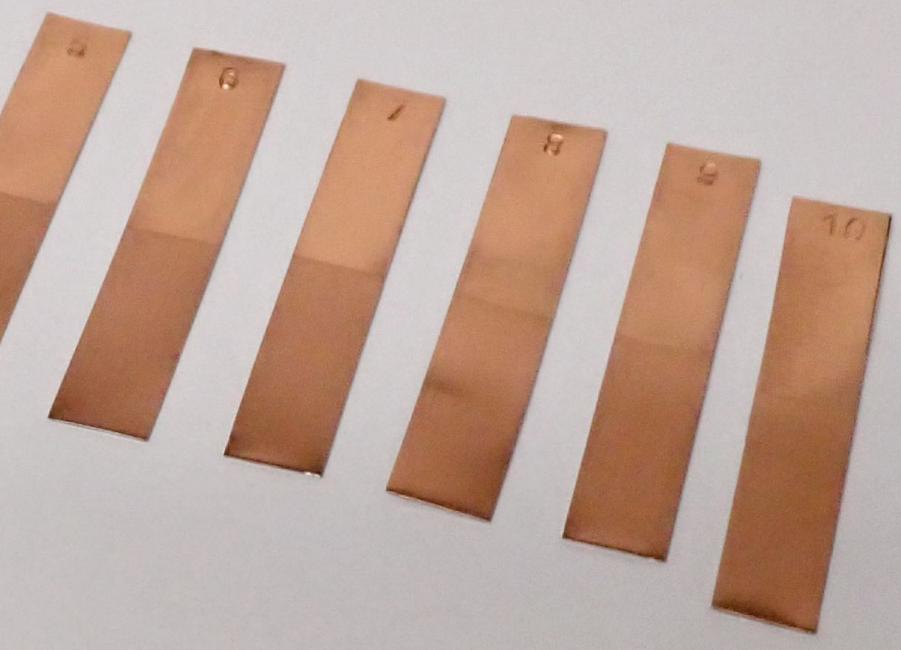


Sample	20°	
T568 T050416	1.6	
T569 T050416	3.3	
T570 T050516	20.4	
T571 T050516	22.5	60
T572 T050516	17.5	55

Sampling phase

Courtesy MNH

polyvinyl acetate) : Paraloid B72 (Ethyl-Methacrylat
er) = (50:50) in acetone:toluene=5:2



Measure

23:44 2024.11.20

60°	85°
14.1	18.6
20.9	20.1
50.4	28.0
6.8	26.1
7	23.2



“Over the years, environmental protection has also become increasingly important on a global scale. We have focused on finding eco-friendly and sustainable materials and technologies that would have less impact not only on the environment but also on the artworks themselves. These three factors — protecting staff, protecting the environment and protecting the artworks — are our main motivations.

— *D^r Balázs Lencz*

Our goal is to find an effective cleaning solution and then stabilise its components. The object has an internal wooden structure with minerals and crystals glued onto it using animal glue and the entire piece is beginning to deteriorate. There are cracks and areas where components are detaching, so we need to clean and stabilise it simultaneously. This project offers cutting-edge technology that could be instrumental in its conservation. We have also working on other objects, such as a modern-era faux leather bag in poor condition, Austro-Hungarian soldier insignias from World War I from the MNH's Coin Collection. These items represent characteristic materials of the time, made from zinc-based alloys, bronze, copper, enamel and more. Another example is a stunning 19th-century belt that belonged to a nobleman, crafted from leather, velvet, linen, gilded silver, silver, brass, iron and glass. We have tried to provide artworks with the most diverse range of materials possible for the case studies.

What are the next steps for testing the products on these artworks?

We are continuing with sample tests and case study object tests. We are considering presenting the *Handstein* at the Osaka World Expo, although we are extremely busy and I am not sure we will be able to meet the deadlines. Soon, we will receive innovative coatings to test, starting with samples. We are also developing packaging materials and have already received boxes from ZFB in Leipzig. I will be travelling to the University of Ljubljana, where

they will conduct VOC measurements for the storage boxes and objects. Collaboration with our GREENART partners is essential, as we have limited access to analytical equipment. Working with partner institutions is therefore highly beneficial. We are also planning dissemination activities. As the Hungarian National Museum is a central institution in Hungary, we have a responsibility to share our knowledge about conservation and environmentally friendly approaches. We have presented at conferences and are planning a workshop this summer with colleagues from the project.

The GREENART project involves institutions from around the world, including the United States and Asia. How does your museum collaborate with all these institutions?

During our conservation meetings, it is very helpful to see the development work and test results from the various partners. As end users of these materials, it is important for us to communicate with other museum partners facing similar challenges. It is impossible to work directly with all the conservation partners, so we primarily focus on the end-user institutions. When we have direct contact with specific research institutions, it is usually because we are dealing with a particular object or issue that we cannot resolve on our own.

The Hungarian National Museum is also involved in other EU-funded projects to protect cultural heritage. Do you exchange knowledge internally about these different European projects or are they completely separate?

We try to integrate the results, ideas and key findings from all these projects. The conservation department is also involved in the AURORA project and other proposals outside the EU's Horizon framework. [The AURORA project, Artwork Unique Recognition and Tracking through Chemical Analysis, uses encoded data, miniaturised devices and blockchain technology to combat looting, trafficking and illicit trade of cultural goods, editor's note] We see this as a knowledge network, interconnecting different aspects of conservation to generate meaningful insights into how to treat objects in general. Everything is connected, whether we are talking about storage, corrective conservation or preventive conservation. All these projects are pieces of a larger puzzle. When we put them together, we can create a comprehensive system to protect cultural heritage and preserve it for future generations.



Consolidation detail

Courtesy MNH

Testing GREENART cleaning gels
Courtesy MNH







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