GLASS & CERAMICS CONSERVATION

Newsletter of the ICOM-CC Glass and Ceramics Working Group

MICOM International council of museums - committee for conservation



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EDITORIAL

Dear Glass and Ceramics working group members and friends,

I am very pleased to write the editorial of our first newsletter for the year 2025. The Glass and Ceramics Working Group newsletter has reached its 30th issue!

Last year, the Glass and Ceramics Working Group introduced a new activity, the online talks, and on November 12th 2024 we were most delighted to host Stephen P. Koob (Chief Conservator Emeritus, The Corning Museum of Glass) as our first speaker. Stephen Koob discussed adhesives for glass and ceramics objects with special reference to Paraloid B72 (find more details in p. 9 of the current issue).

In this issue we include a contribution focusing on metal corrosion induces from glass by Gerhard Eggert and Andrea Fischer. Following this, Kelci Sibley from Corning Museum of Glass gives us a brief overview of the unique TV Show *Blown Away*, which showcases the art of glassblowing. The Corning Museum of Glass serves as a guidance counselor and partner for the show.

Moreover, this issue will include a review by Maria Krini of the ICOM Working Group on Collections in Storage conference *Museum Storage, Current situation and future challenges*, that took place in Paris from October 29 to 31, 2024.

Additionally, you will find announchments for upcoming conferences and workshops.

Have a nice time reading issue 30 of the Glass and Ceramics Working Group newsletter.

Polytimi Loukopoulou ICOM-CC Glass and Ceramics Working Group Coordinator



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Cover image: Close up of a blue bowl with gilt brass base, mid-nineteenth century, Veste Coburg (HA 557). © A.Fischer, SABK.

21st ICOM-CC Triennial Conference

The 21st ICOM-CC Trienial Conference will take place in Oslo, Norway, on September 14-18, 2026.

The theme for the 2026 Triennial Conference is **Cultural Connections in Conservation**

Cultural connections are at the heart of why we conserve heritage. These connections—whether societal, professional, or temporal—are vital for understanding and preserving the cultural identities embodied in material culture. As global changes and societal shifts accelerate, the need to respect and advocate for diverse voices and communities, including Indigenous cultures, has become ever more critical. In light of new challenges and opportunities, the 2026 ICOM-CC Triennial Conference will explore how conservation can embrace inclusive collaborations, adapt to changing contexts, and ensure that conservation knowledge is accessible and impactful. By integrating ethical approaches, interdisciplinary methods, and innovative technologies, conservation can play a pivotal role in bridging divides and fostering connections.

At the Oslo Meeting we aim to answer questions such as:

- How can conservation establish new and renew existing professional connections to address global challenges?
- How can conservation navigate temporal connections between the past, present, and future understandings, and uses of material culture?
- How can conservation help advocate for diversity and cross-cultural communication?
- How can conservation help to bridge inter-generational cultural divides?

IMPORTANT DATES

Submission of preliminary abstracts for papers closed on April 4, 2025.

Additional information are available on the conference website.



How Glass Induces Metal Corrosion

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Figure 1: GIMME at work: Pocket watch from the Museum für Hamburgische Geschichte, Inv. Nr. 1899.101b, 'weeping' glass (drops on the glass inner side) with brass corrosion products at the contact zone: green=sodium copper formate (5), and white=zinc formate (7). © A.Fischer, SABK.

Have you seen that: Corrosion on a metal object, but only in the contact zone with glass?

At the ICOM-CC Triennial Conference in New Delhi (2008), the first paper 'When glass and metal corrode together' about that phenomenon was published. Updates were then given at the ICOM-CC Working Group 'Glass & Ceramics' Interim Meeting in Corning (2010) and the next ICOM-CC Triennial Conference in Lisbon (2011). As research proceeded, this developed into a series of papers I-VII on corrosion products¹.

With hindsight, we are not totally happy with the title as it puts glass and metal on the same level in the mechanism. In reality, glass is the perpetrator and metal the victim. Therefore, we now prefer the term glass-induced metalcorrosion (on museum exhibits), GIM or GIMME for short. After nearly two decades of research, we now got a better understanding of the phenomenon and can answer some questions.

What happens at the glass surface?

[Lovers of chemical formulae: the footnotes below are for you!]

Due to an ion-exchange reaction with humidity, a solution containing sodium hydroxide² (forms on the surface of soda glass. When exposed to atmospheric carbon dioxide, this solution converts to sodium carbonate³. Similarly, potash glasses develop corresponding potassium compounds. Additionally, if and when exposed to the ubiquitous pollutant formaldehyde (HCHO), formate ions (HCOO⁻) are also produced via the Cannizzaro reaction⁴.

- 1 See the bibliography in the review cited below.
- 2 Sodium ions in the glass network are exchanged against H+ from water: \equiv Si-O⁻Na⁺ + H₂O $\rightarrow \equiv$ Si-O-H + Na⁺OH⁻

3
$$2Na^+OH^- + CO_a^2 \rightarrow Na + 2CO_a^{2-} + H_aO_a^2$$

4 2HCHO + Na⁺OH⁻ \rightarrow Na⁺HCOO⁻ + CH₃OH⁺

Why does glass induce metal corrosion?

Alkaline solutions resulting from glass hydrolysis serve as ideal electrolytes to speed up metal corrosion. In this process, metal atoms (Me) enter the solution as cations (Meⁿ⁺) at anodic sites, leaving behind electrons (e^{-})⁵. These electrons flow through the metal to cathodic sites, where they are consumed by species in the solution, most often dissolved oxygen (O₂) molecules⁶. This electron flow, or electric current, must be balanced by an equivalent charge transport in the solution. The more ions as charge carriers are present, the faster the charge transport and the corrosion process. For example, if you immerse half of an iron nail in pure water, corrosion will occur slowly. Now add some common salt – and you will soon see the difference!

Which metals are prone to GIMME?

The presence of alkali ions (sodium or potassium) and the resulting alkaline pH give rise to the formation of unique corrosion products, rarely observed on objects not in contact to glass. On lead alloys, we identified basic alkali lead carbonates. On copper alloys, including historic silver containing some percentage of copper), we detected mainly basic copper formates, while we observed zinc formates on brass. In contrast, no special corrosion products were found on iron and tin where the usual oxides/hydroxides dominate.



Figure 2: Blue bowl with gilt brass base, mid-nineteenth century, Veste Coburg (HA 557). Note white crystals in the upper region from glass hydrolysis. Light green metal corrosion: basic sodium copper formate (5). © A.Fischer, SABK

- 5 Me \rightarrow Meⁿ⁺ + ne⁻ (n= 1, 2,..)
- $6 \qquad O_2 + 2 H_2 O + 4e^- \rightarrow 4 O H^-$

Which corrosion products have been discovered?

Carbonates

- 1. Sodium lead carbonate hydroxide
- 2. Potassium lead carbonate hydroxide
- 3. Sodium dicarbonatocuprate (II) trihydrate
- 4. Sodium copper acetate carboante hydrate

Formates

- 5. Sodium copper formate hydroxyde oxide hydrate
- 6. Copper formate dihydrate
- 7. Zinc formate dehydrate
- 8. Zinc copper formate hydroxide hydrate

Uncharacterized Compounds

Compounds containing Na, K, Cu, and/or Zn, often carboxylates

 $\label{eq:starsess} \begin{array}{l} NaPb_2(CO_3)_2(OH) \\ KPb_2(CO_3)_2(OH) \\ Na_2[Cu(CO_3)_2]\cdot 3H_2O \\ NaCu(CH_3COO)(CO_3)\cdot nH_2O \end{array}$

 $\begin{array}{l} Cu_{4}Na_{4}O(HCOO)_{8}(OH)_{2}\cdot 4H_{2}O\\ Cu_{2}(HCOO)(OH)_{3}\\ Zn(HCOO)_{2}\cdot 2H_{2}O\\ Zn_{4}Cu_{3}(Zn_{1-x}Cu_{x})_{6}(HCOO)_{8}\cdot (OH)_{18}\cdot 6(H_{2}O), \ 0 \leq x \leq 1 \end{array}$



Figure 3: (a) Potash glass beer jug with pewter mounting, ca. 1800 AD, Veste Coburg, (b) basic potassium lead carbonate (2) in contact to glass. © A.Fischer, SABK

What kind of objects can develop GIMME?

All copper and lead alloy objects where electrolyte from glass hydrolysis comes in contact with the metal. When glass is fused directly onto metal (e.g, enamel or glass figures with interior metal wires), corrosion can occur in cracks or at the edges. Other objects achieve tight contact through mechanical pressure: metal mounted glass vessels, glass gems in bezels (often found in folk jewellery), cover glasses on metal (glass framed miniatures or daguerreotypes with metal passe-partouts, watches), lenses hold by metal (spectacles, optical instruments), glass levels mounted in brass, miners' lamps, and electric bulbs. Loose contact occurs in glass elements (e.g., beads) on metal wires. Here, isolation of the materials with coating or plastic foils is possible. Drops of electrolyte can also run down vessels or fall from cover glasses, leading to corrosion in areas without direct contact between glass and metal.

How rare is GIMME?

The late discovery of this phenomenon led to the assumption that it must be very rare. However, this is not true: surveys conducted at the Swiss National Museum in Zurich and the German Mining Museum in Bochum found that light cases, such as a slight discolouration of enamel in contact to copper, occurin the 10-20% of all combined metal/glass objects. 1-2% of these objects show severe corrosion, which can easily be seen and allows for the sampling of corrosion products. Take a look at your own collection, it is very likely that you can identify similar cases!

Where can I find more information?

A review of our research has been published and is available open access (<u>https://doi.org/10.3390/cmd3030030</u>). There, you can find references to the original publications. For more detailed information, including images of objects & corrosion and Raman reference spectra of corrosion products, please refer to the doctoral dissertation of Andrea Fischer (<u>https:// doi.org/10.11588/artdok.00005210</u>).

What should I do if I discover GIMME cases?

Get them analysed! Formates point to the influence of atmospheric formaldehyde pollution. If you need help, please contact us for collaboration. As there are still a number of unidentified corrosion products, we are interested in obtaining samples for further research. We are quite optimistic: modern X-ray Powder Diffraction was able to solve the crystal structure – and thus the formulas – of such complex compounds like (5) and (8). Suitable single crystals are no longer necessary, powders will do!

Review of Stephen Koob's webinar: Adhesives for Ceramics and Glass (with special reference to Paraloid B-72)

Polytimi Loukopoulou ICOM-CC Glass and Ceramics Working Group Coordinator polylouk@gmail.com

On the 12th of November Stephen P. Koob inaugurated the Glass and Ceramics Working Group's online lectures series with his talk 'Adhesives for ceramics and glass - with special reference to Paraloid B72'.

Stephen Koob set off the conversation with a review of early adhesives for ceramics and glass objects, highlighting the problems associated with their use, and emphasizing the need for an alternative, The alternative was found in Paraloid B-72. The lecture continued with an in-depth presentation on Paraloid B72, detailing its preparation method and uses both as a consolidant and adhesive.

This inspiring lecture included numerous case studies, richly illustrated with low- and highfired ceramics and glass objects of various categories. Koob concluded the first part of his talk by discussing the limitations of Paraloid B72.

He then moved on to present the epoxy resins commonly used in conservation, offering detailed information on their preparation, use and limitations. Throughout the talk, he referenced relevant publications. Despite the lengthy presentation on the two principal adhesives used for glass and ceramics, Koob was more than happy to answer a great number of questions.

We would like to express our gratitude to Stephen Koob for accepting our invitation and his eagerness to enlighten us on several topics and further discuss certain issues. We would like to mention that the event was very well attended, and we thank all our members and friends who participated. because he provided a significant amount of information to the younger colleagues, while reminded the rest about the details of working with Paraloid B72 and epoxies. We look forward to holding many more successful online talks in the near future, with the hope they will spark the interest of our community.



Stephen Koob, retired, Chief Conservator Emeritus, The Corning Museum of Glass

Steven Koob's lecture was particularly interesting

Review: Museum Storage: Current situation and new challenges. Paris, 28-31 October 2024

Maria Krini Helleninc Ministry of Culture, Directorate of Consevation of Ancient and Modern Monuments <u>mkrini@culture.gr</u>

ICOM-Working Group for Collections in Storage, ICOM International Committee for Museum Architecture and Technology (ICAMT), and Sorbonne Nouvelle University organised the international conference dedicated to museum storage held at Sorbonne Nouvelle in Paris in October 2024.

The meeting began with a presentation by François Mairesse, president of the ICOM-Working Group for Collections in Storage, who shared insights from the ICOM international survey on museum storage. The survey captures the global state of museum storage, revealing that less than 15% of museum collections are on display to the public, while more than half of the storage spaces are at full capacity. Additionally, only half of the spaces used as museum storage spaces are specifically designed for this purpose, approximately 60% lack adequate equipment, and 40% do not have written operating regulations. The detailed results of the survey are available at: <u>https://icom.museum/en/</u> <u>news/museum-storage-around-the-world/</u>. This survey served as a foundation for further discussion throughout the conference.

The conference was structured in plenary and parallel sessions, addressing a wide range of topics related to museum storage, including management and operational issues, architectural solutions, documentation and digitization, conservation and sustainability, education and training. The ICCROM RE-ORG method (https://www.iccrom. org/programmes/re-org), which focuses on the reorganization of museum storage, was presented both as a strategy and as a practical application



The closing remarks of the conference, by Gaël de Guichen and Hélène Vassal, ©Maria Krini

for museum storage facilities. Additionally, several countries presented their national or regional programs and strategies, developed on the basis of the RE-ORG method but adapted to meet their specific national requirements.

The conference provided participants with the opportunity to visit several museum storage facilities across France, including Paris. Notable visits included the Louvre's storage facilities in Liévin, Northern France, a specially designed conservation and research center housing approximately 250,000 works from the museum's collections. Participants also toured the storage facilities of the Quais Branly Museum, which holds collections of non-European cultures from all historical periods, and the Arts et Métiers Museum, which preserves collections related to sciences, crafts, and industry.

The conference conclusions were presented by Gaël de Guichen and Hélène Vassal, with the assistance of PhD students from Sorbonne Nouvelle University who summarized the 3-day plenary and parallel sessions. They highlighted the importance of this conference, almost half a century after the first international conference, held in 1976 at the initiative of Paul Perrot, dedicated exclusively to museum storage. The large participation, with approximately 400 participants from all over the world, demonstrated the importance that storage has nowadays for a museum organisation. The increased interest in research and exchange of views was also highlighted: a total of 12 presentations by invited keynote speakers, 69 oral presentations and 31 posters were presented.

Finally, the preparatory steps for the creation of a new ICOM International Committee on Collection in Storage were announced and the objectives of this committee were widely discussed. The ICOM Storage is soon to be established to give hopefully major attention to a critical and underrepresented function of the museum organizations.

Blown Away - a glassblowing competition

Kelci Sibley The Corning Museum of Glass SibleyKR@cmog.org

Corning Museum of Glass (CMoG) began a creative partnership with Netflix's competition glassblowing series, Blown Away, before it launched in July 2019. The Museum's Hot Glass Team has participated in every season of the series and offers a key component of the show's prize package: a one-week guest artist residency at CMoG's Amphitheater Hot Shop and a display of the winning installation.

Blown Away is the first-ever television competition series featuring the art of glassmaking. It follows a group of 10 highly skilled glassmakers from North America who fabricate beautiful works of art that are assessed by a panel of expert judges. CMoG celebrates the artists from each season with a special display of works from the show that feature each participant. It is the only place in the world where fans of the show can see their favorite works from the most recent season.

Each season of Blown Away is bigger than the season before, and Season 4 drove up the drama with the addition of a mini-Venetian-themed challenge hosted on the Corning Museum of Glass Mobile Hot Shop stage in episode 9 and featuring guest evaluator, Bill Gudenrath, resident advisor at The Studio at the Corning Museum of Glass.

Within its first week on air, Season 4 reached the Netflix Global Top 10 with 1.5 million viewers. It also reached the top ten in the U.S., Canada, Australia, and New Zealand in the first week on air. Aligned with the March 8, 2024 release of Season 4, the Museum's Blown Away display opened to the public on March 10, 2024.

While fans who make the journey to Corning to see their favorite pieces from the show, getting the glass display ready is an adventure that requires a variety of departments within the Museum, especially conservation. What many fans don't see are the challenges that come with assembling large-scale, intricate glass works in four to five hours with minimal time to cold-work. For the glass novice, that sounds like plenty of time to create a piece that will stand the test of time, right?

"One thing that is not clear from the show is how much cold work is done on these pieces; many of the individual glass elements are glued on, often with silicone. In most cases this hasn't been a huge problem, but the combination of silicone and a glass element filled with water in one object was disastrous. This piece included a large blown element, filled with water, with a figure made of smaller glass elements that were glued together on top. The hole in the water filled element was located in the base and was sealed with silicone. It developed a leak that we couldn't stop. Despite our efforts to contain the water, the humidity in the case was high enough that it caused the other glued on elements to fall off one by one and finally caused the joins on the plexiglass bonnet to come apart too." - Astrid van Giffen, conservator at Corning Museum of Glass.

In late 2024, the Museum learned that Netflix had not renewed Blown Away for a new season. Despite this, the series remains a major visitation driver for CMoG, as many fans cite it as the reason they traveled to Corning.

To celebrate the success of the series and continue to provide fans with a place to engage with the show, CMoG is in the exploratory stages of a potential exhibition that will feature new pieces from artists who participated in the show. While there won't be more Blown Away to watch on Netflix, fans can always make the trip to the Corning Museum of Glass to fulfill their glassy dreams and see expert glassblowers at work.

UPCOMING EVENTS

3000 Years of Glass in Architecture and Construction in the Ancient and Historical Worlds

May 16, 2025 London, UK

This meeting offers a unique opportunity to delve into the fascinating and diverse applications of glass in architecture and construction throughout history. While window glass will be covered, we will also explore the broader spectrum of glass usage, such as mosaics, furniture, and inlays in other materails.

Additional information available on their <u>website</u>.

2025 Debelt, Bulgaria: Conservation of Ancient Greek Pottery

June 7-21, 2025 Debelt, Bulgaria

This introductory workshop in the conservation of ceramics will focus on ancient Greek pottery recovered from the Western Black Sea coast of Bulgaria. The program will guide students through the history of Ancient Greek pottery and the process of pottery conservation, restoration, documentation, and study.

The course will include practical work in ancient pottery conservation, lectures on relevant topics, and excussions to the towns of Nessebar and Sozopol.

Additional information available on their website.

Summer School in Roman Pottery 2025

June 29 - July 26, 2025 Lugnano in Teverina, Italy

A four-week program designed to introduce participants to Roman pottery analysis. Potsherds are common finds on classical archaeological sites, providing crucial evidence



for dating, trade relations, economic exchange, food consumption, and identity studies. Pottery studies are essential in archaeological training, best learned through direct contact with ceramics..

Additional information available on their <u>website</u>.

23rd Congress of the Association International pour l'Historie du Verre (AIHV)

September 8-12, 2025 Mainz, Germany

The congress, held every three years, serves as a platform where experts gather to share their research and insights on glass, including its use, history, and aesthetic qualities from antiquity to the present day. Contributions on all aspects of glass history are welcome.

Additional information available on their <u>website</u>.

17th European Meeting on Ancient Ceramics (EMAC)

September 10-12, 2025 Bilbao, Spain

The European Meeting on Ancient Ceramics (EMAC) is a biennial conference that gathers scholars and researchers with diverse backgrounds in archaeometric studies of ancient ceramics. EMAC 2025, held in Bilbao, will showcase cutting-edge methodologies, advanced laboratory techniques, and case studies on technological and provenance research of ancient ceramics from around the world.

Additional information available on their website.

Southwest LKiln Conference

Safford, Arizona October 17-19, 2025

The Southwest Kiln Conference is an annual gathering of potters, archaeologists, and enthusiasts who come together to explore and recreate ancient Southwestern pottery techniques. Think of it as part artist meetup, part history lab-folks bring their own clay pots, fire them in traditional setups like trench or pit kilns, and swap ideas about how the old masters pulled it off.

Additional information available on their <u>website</u>.

Amphorae et Dolia: Production and Trade of Amphorae and Large Containers in the Western Mediterranean during the Roman Era

October 29-30, 2025 Tarragona, Spain

The conference aims to establish itself as a reference point for Roman pottery studies, focusing this edition on the production and trade of amphorae and dolia in the Western Mediterranean during Roman times. These vessels, essential for food storage and transport, are key to understanding the economic and commercial dynamics of the Roman world

Additional information available on their website.

Archaeometry Conference on Stone, Glass, Ceramics and Metals

November 8-9, 2025 Chaina, Greece

The UISPP Commission on the Archaeometry of Prehistoric and Protohistoric Inorganic Artefacts, Materials and their Technologies is organizing an Archaeometry Conference on Stone, Glass, Ceramics and Metals at Chania Museum as a UISPP Archaeometry colloquium for the year 2025. It welcomes contributions on topics related to the materials listed above, and participants from other UISPP commissions and from other institutions working on related topics.

Additional information available on their <u>website</u>.

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