

Imitating aventurine: an eighteenth-century technique of lacquer imitation

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Abstract

The technique of aventurine was used on japanned decorative schemes throughout eighteenth-century Europe. Presented here is a case study of its replication on a German writing cabinet currently (November 2016) on display in the Victoria and Albert Museum's Europe 1600-1815 Galleries.

The cabinet (W.62-1979) was made in Dresden around 1745-1749, with the japanning decoration attributed to Christian Reinow (1685-1749) (figure 1).¹ It was most likely made for Heinrich, Count von Brühl (1700-1763), the most powerful politician at the courts of Saxony and Poland. It is recorded in the inventory at Brühl's Schloss Seifersdorf in 1765. The cabinet features large areas of aventurine framing the blue japanning. The technique gives a highly polished, golden glittery surface. As with many of the japanning methods, this western technique evokes a specific Asian aesthetic. It closely resembles the Japanese decorative lacquer

technique of *nashiji*, where randomly shaped gold and silver flakes are evenly sprinkled on the lacquer, with subsequent layers of yellow-tinted lacquer.

Microscopic cross-section analysis of the cabinet's aventurine surface revealed a method consistent with other well-documented objects and interiors:² Silver-plated copper flakes are embedded in a natural resin varnish with further layers of yellow-coloured varnish on top (figure 2). XRF analysis confirmed the presence of copper and silver in the flakes. Close-up images of the individual flakes show the thin layer of silver and the copper underneath (figure 3). Striations along the length of the flake indicate that the copper was drawn into wire and then flattened into ribbons. Böckelmann describes the process of wrapping the wire around a spool in order to cut the ribbons in to small squares and the ragged cut edge is visible in the image.³

The cabinet was conserved as part of the Victoria and Albert Museum's Europe 1600-1815 gallery refurbishment project. An extensive treatment involved the consolidation of the japanned surface, retouching losses and cleaning of the brass mounts. The bottom section's front corners had an ovolo moulding that was conspicuously missing its aventurine decoration. Both left and right sections of the moulding were covered with a thick layer of varnish that appeared to have blackened with age (figure 4). This was likely to have been due to the oxidation of a bronze powder paint that had been applied over the missing and damaged decoration. Some of the original decoration was visible where the overpaint had chipped away, however it appeared to be in very bad condition. Further cross-section microscopy confirmed this, with multiple layers of overpaint mixed with metallic (bronze) powder and flakes.

As one of the star furniture objects in the gallery there was a desire to improve the visual appearance and legibility of the design. On the upper section of the cabinet there were a small number of losses, but for the most part the aventurine of the ovolo moulding remained intact. This resulted in a visual



Figure 1 Writing cabinet, Dresden ca. 1745-1749, (W.62-1979), after treatment.

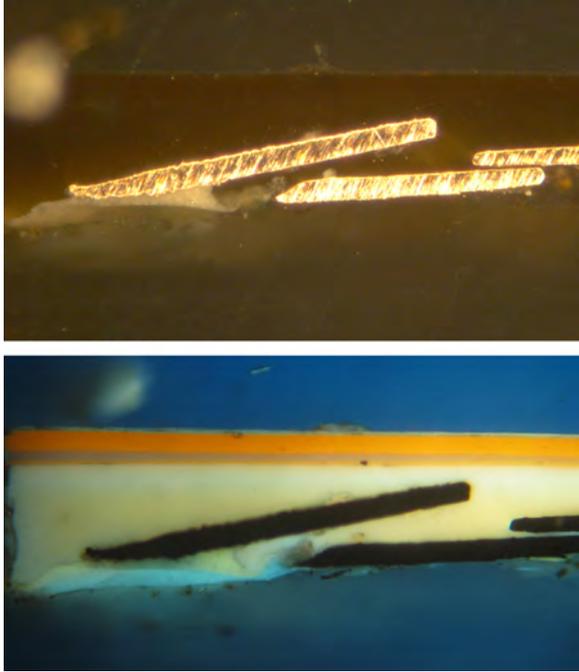


Figure 2 Cross-section photomicrograph under visible (top) and UV (bottom) illumination showing the metal flakes embedded in a white fluorescing varnish with subsequent layers of orange fluorescing varnish.

interruption and disconnection of the aventurine running from top to bottom.

Initial solvent testing revealed the difficulty in removing the overpaint without damaging the underlying layers. On inspection of the more successful test areas, the original decoration appeared in such bad condition that the best option would be to replicate the decoration and not remove the overpaint.

This decision meant that the replicated decoration would have to fulfil a certain number of criteria. Of primary concern was that the replica should not interfere with the original surface. This precluded building up layers of new aventurine varnish over the losses. Any replacement should also be readily identifiable as such. This led to the development of the idea that the new material should be a separate and easily removable layer using synthetic and stable materials.

Replication of the aventurine

Two materials were trialled for the creation of a film that could be applied to the object: acrylic dispersions and epoxy resins. One can make effective films using the acrylic dispersion Lascaux 498 HV by spreading the adhesive spread out on to silicone release polyester film using a glass rod. The film dries clear and flexible. Various materials were trialled for the replication of the silver-plated copper flakes. Modern epoxy-coated aluminium foil glitter can be purchased in a variety of square sizes. However, when these were used it was difficult to replicate the randomness of the original and it appeared too uniform. Pure gold Japanese nashiji flakes proved to be more effective: although

Figure 4 The whole front corner section of ovolo moulding was damaged and missing aventurine.

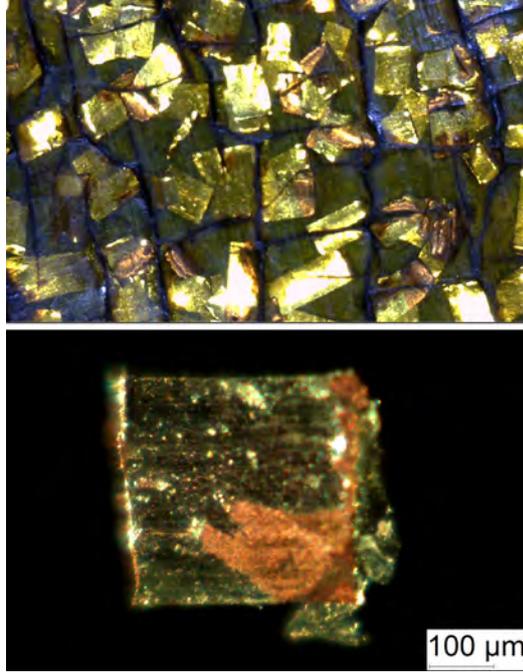


Figure 3 Close-up photograph of the aventurine surface (top) and photomicrograph of a single aventurine flake, approximately 2.5 mm square.

they are not square but randomly shaped they gave a much closer impression to the original design. An equal mixture of size 6 and size 8 nashiji flakes were used.

For the replication the 498 HV was tinted using Orasol metal complex dyes mixed as 2% w/v solutions in denatured alcohol. A set of dyes was made





Figure 5 A silicone rubber mould with a 1 mm deep impression.

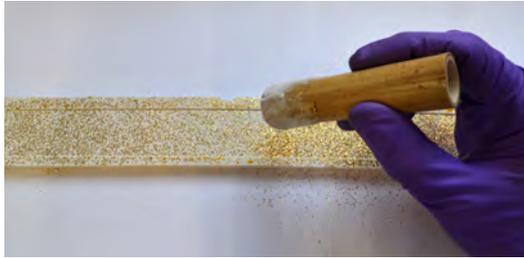


Figure 6 Sprinkling the nashiji flakes into the mould.

up in pipette dropper bottles so that a dye recipe could be accurately developed and repeated. Orasol Brown 2GL (now Brown 322) and Yellow 2GLN (now Yellow 152) were used in a ratio of 1:40 per 10 g of acrylic and 2 g of nashiji flakes were mixed in. When spread out thinly and evenly the resulting film was approximately 160 x 35 mm.

The acrylic film proved highly effective in restoring the smaller losses over the cabinet. The film could be easily cut out with a scalpel and adhered using a heated spatula and more 498 HV adhesive. However, the flexibility of the film proved to be a problem when trying to scale up the films to the larger section of ovolo decoration. For this a more rigid and durable material was required and so epoxy resins were then trialled.

Initial experiments in casting the epoxy straight on to a polyester film were not successful, especially the silicone-coated film that caused the epoxy to bead up. Greater control over the film was achieved by making a RTV silicone rubber mould to contain the epoxy (figure 5). The silicone was cast over a 1 mm thick piece of Perspex in order to create a thin tray, 600 mm long and 30 mm wide.

The nashiji flakes were used in the same proportions as the acrylic films, however, they tended to sink in the epoxy so the flakes had to be sprinkled out on the silicone mould using a *funzutsu*, a bamboo tube with a mesh covering one end. In Japanese lacquerwork these tubes with different mesh sizes allow the craftsman to have great control over density and evenness of sprinkling. In this case accuracy was not so critical: simply a dense and even carpet of flakes on the surface of the silicone (figure 6).

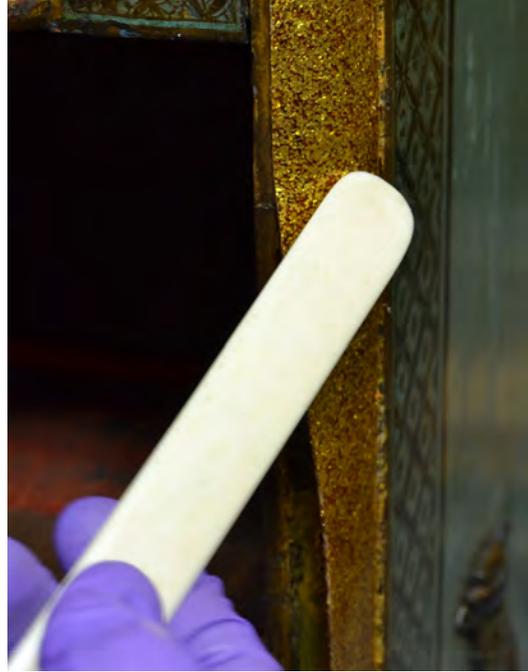


Figure 7 The film being attached and formed around the moulding after being heated.

Some epoxy resins yellow more than others, but in this scenario a small degree of yellowing was not considered to be an issue. Fynebond epoxy was used, although studies have shown it may not be the most resistant to yellowing.⁴ Once adhered the final colouring of the films was achieved using Laropal A81 in a 10% w/v concentration dissolved in a 3:1 mixture of Shellsol D40 and trimethylbenzene, tinted with the Orasol dyes. Having this layer of dark colour was reassuring because if the epoxy yellowed significantly in the future, the Laropal varnish could be removed and the appearance lightened.

The epoxy was mixed according to the manufacturer's instructions and then tinted, again using the Orasol dyes in denatured alcohol. The mixture was poured into the mould with the walls of the impression helping to contain the epoxy evenly rather than creating a specific thickness. The actual thickness of the film was around 0.5 mm, although it would have been possible to abrade the film thinner if required. Fynebond takes 36-48 hours to cure at typical room temperature. After around 30 hours the epoxy was no longer tacky and could be removed from the mould but was still very flexible and could be stretched. This was useful for working on small areas but would have been harder to handle on the long ovolo sections. After 48 hours the strips were fully cured and hard.

Once fully cured the epoxy strips could be made flexible again with gentle heat from a hair dryer. This way they could be cut to the correct size and simply moulded in place with heat (figure 7). As the epoxy cooled it retained its moulded shape. An adhesive was required that would have high tack and preferably a degree of heat-set to hold the strips

in place as they cooled. It also had to be completely removable in the future and cause no damage to the object's surface. Mowilith 50 polyvinyl acetate 35% w/v in toluene had the correct adhesive properties, long-term stability and the historical surface was not sensitive to aromatic hydrocarbons.

As the strips were not fully opaque, a background colour also had to be applied to the object. In order not to introduce an additional layer into the adhesive system that could be the cause of failure in the future, the colour was incorporated into the Mowilith 50 by mixing in an amount of yellow ochre earth pigment. The adhesive was applied to both the object and the strip. Five minutes after application the surfaces became touch-dry and as the strip was placed on the object an instant contact bond was made. The strip was moulded in place using the hair dryer and a bone folder to apply pressure. With a glass transition temperature of around 35-45 °C the Mowilith 50 also softened under the heat and as the epoxy and adhesive cooled a strong bond was achieved. With its solubility in toluene the strips can be easily removed.

Once in place any joins in the epoxy strip could be covered using Mowilith 50 and some sprinkled nashiji. The colour of the strips was generally the

correct hue but needed darkening with the Laropal A81 and dyes to match the original (figure 8) After the Laropal had fully dried the gloss could be modulated using a 1:1 mixture of beeswax and carnauba wax dissolved into a paste with the aliphatic hydrocarbon Shellsol D40. Proprietary paste waxes had to be avoided, as any aromatic content would disrupt the Laropal layer.

During the trial runs the gold flakes could be easily extracted from the epoxy using dichloromethane. The ease of dissolution was time dependent as the epoxy slowly cross-links. Up to 48 hours and the epoxy from offcuts and trial runs would dissolve completely, any longer and the epoxy would swell and become rubbery, but still release the flakes.

The treatment solved the aesthetic problem on the cabinet caused by the loss and overpainting of the original aventurine. On close inspection the imitation does not deceive the viewer but succeeds in giving a coherent overall effect. In a similar context where any future yellowing of the epoxy would be noticeable, Hxtal NYL epoxy could be substituted. The treatment was relatively time-effective and it demonstrates another appropriate use for epoxy and acrylic films in loss compensation.



Figure 8 Detail of the base corner moulding before (left) and after (right).

Acknowledgments

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Notes

¹ V&A catalogue note <http://collections.vam.ac.uk/item/O58195/writing-cabinet-reinow-christian/> (accessed 02/12/16).

² A. Guzowska, I Zadrożna, E. Jeżewska, A. Leśkiewicz-Laudy, 'Conservation of Chinese Room in the Wilanów Palace of Warsaw as a result of multidisciplinary research', in *Multidisciplinary Conservation: a holistic view for historic interiors*, Joint Interim-Meeting of five ICOM-CC Working Groups, Rome 2010.

³ K. Böckelmann, 'Untersuchungen zur Werkstatt Martin Schnell/Studies in the work of Martin Schnell', in M. Kühenthal, *Japanische und europäische Lackarbeiten: Rezeption, Adaption, Restaurierung / Japanese and European lacquerware: adoption, adaptation, conservation*, Munich, 2000, p. 421.

⁴ C. Totelin, S. Calonne, V. Bechoux, 'Colour Changes of Epoxy Resin Adhesives Used in Glass Restoration by Exposure to NO_x Fumes', in *Proceedings of Symposium 2011: Adhesives and Consolidants for Conservation: Research and Applications*, October 17-21.

Caption credit lines

- Figs 1, 2 © Victoria and Albert Museum, London. All other figures by the author.

Suppliers

- Orasol dyes, Laropal A81, Mowilith 50: Kremer Pigmente
- Fynebond: Fyne Conservation Services, Airds Cottage, St. Catherine Loch Fyne, Argyll cotland PA25 8BA U.K. Contact: www.fyneconservation.com/component?option=com_contact/Itemid,3/, accessed May 23, 2011
- Nashiji gold flakes: Watanabe Shoten Ltd. Japan (www1.odn.ne.jp/j-lacquer/home_eng.html)