

Treatment of a 17th-Century Anglo-Dutch Military Portrait: Reflecting on an Unexpected Lining Process



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Introduction

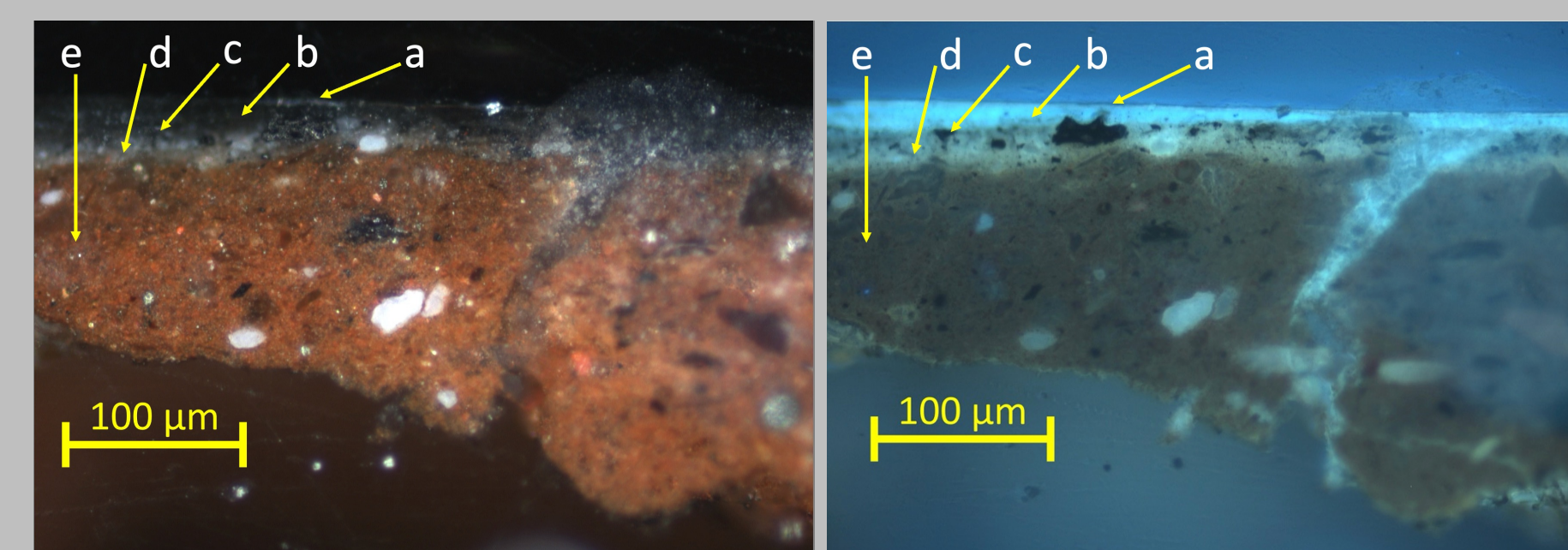
A 17th-c (est.) Anglo-Dutch military portrait (44 x 37 1/8 in.) from the Memorial Art Gallery by an unknown artist was brought to the Garman Art Conservation Department for conservation research and treatment in 2022. The oil on canvas painting exhibited a range of condition issues, including structural instabilities and aesthetic disfigurements alongside previous restoration campaigns. A technical study was completed in conjunction with conservation treatment which improved the overall structural integrity and visual appearance of the artwork. The lining posed practical questions about the latest BEVA® 371a formulation.



Figs. 1-2: Before treatment (left) and after treatment (right), front, normal illumination.

Technical Analysis Results

- Multimodal imaging, X-radiography, Fourier transform infrared spectroscopy, cross-sections, and microscopy identified original and restoration materials.
- X-ray fluorescence spectroscopy identified vermilion, lead white, ochres, iron oxide pigments, and smalt.



Figs. 5-6: Cross-section micrographs, darkfield (left) and UV (right) illumination, indicating layers of dirt (a), varnish layer (b), black or brown pigmented layer (c), white pigmented layer (d), and red preparatory layer (e).



Figs. 3-4: Before treatment (left) and after treatment (right), back, normal illumination.

Structural Treatments

- Facing with wet-strength tissue and isinglass.
- Dry mechanical removal of old, failing glue-paste lining.
- Humidification with low heat over suction table.
- Tear repair: canvas insert, isinglass + wheat starch paste.
- Lining with BEVA® 371a film and linen on hot vacuum table.
- Re-tensioning and tacking to new stretcher.



Fig. 7: Removal of old glue lining.



Fig. 8: Removing facing after lining removal.



Fig. 9: Creating canvas insert.



Fig. 10: Re-tensioning lined painting.

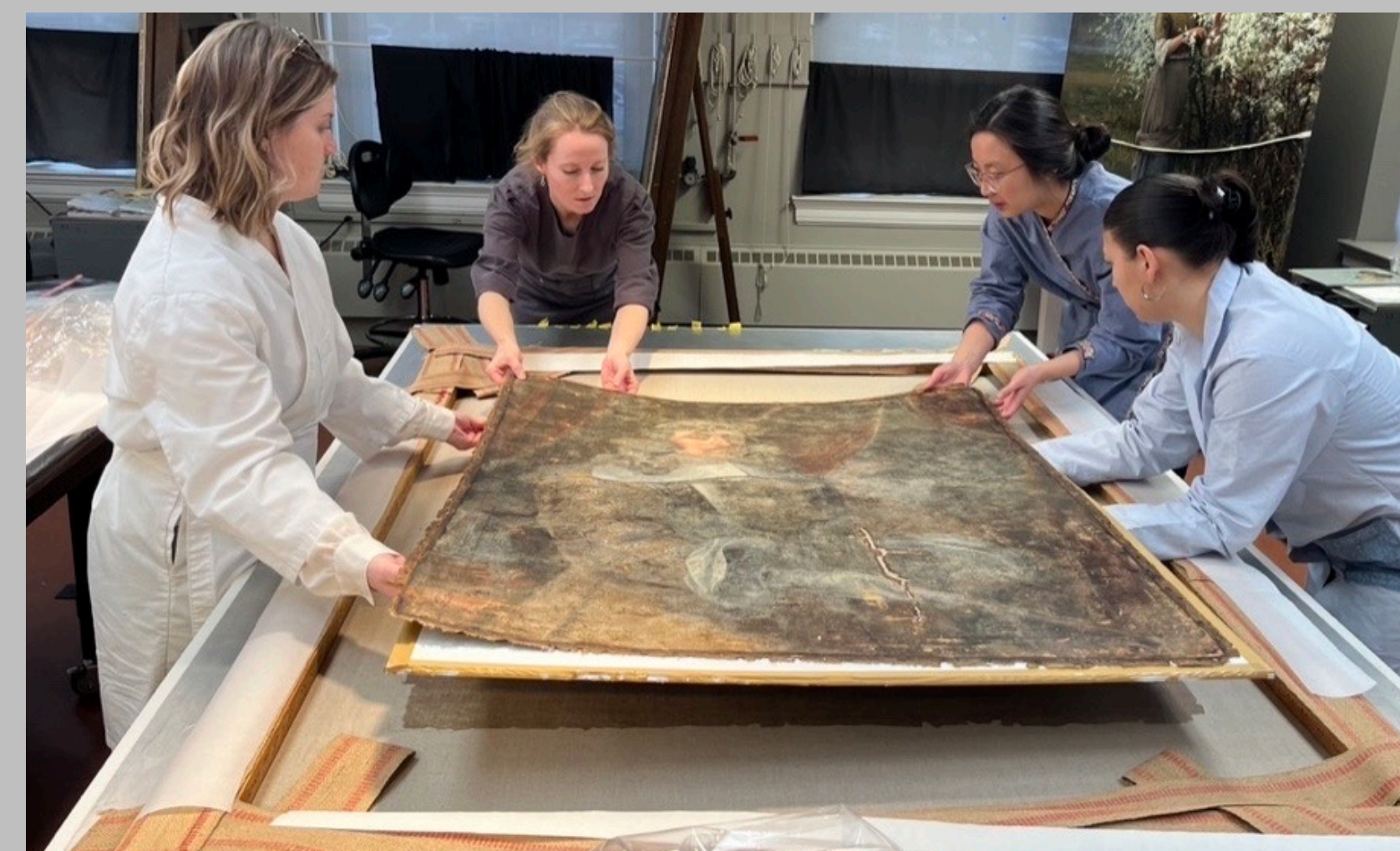


Fig. 11: Positioning painting over BEVA® 371a and canvas on vacuum table.



Fig. 12: Massaging painting during lining to encourage flow of additional liquid BEVA® 371a applied as consolidant.

Aesthetic Treatments

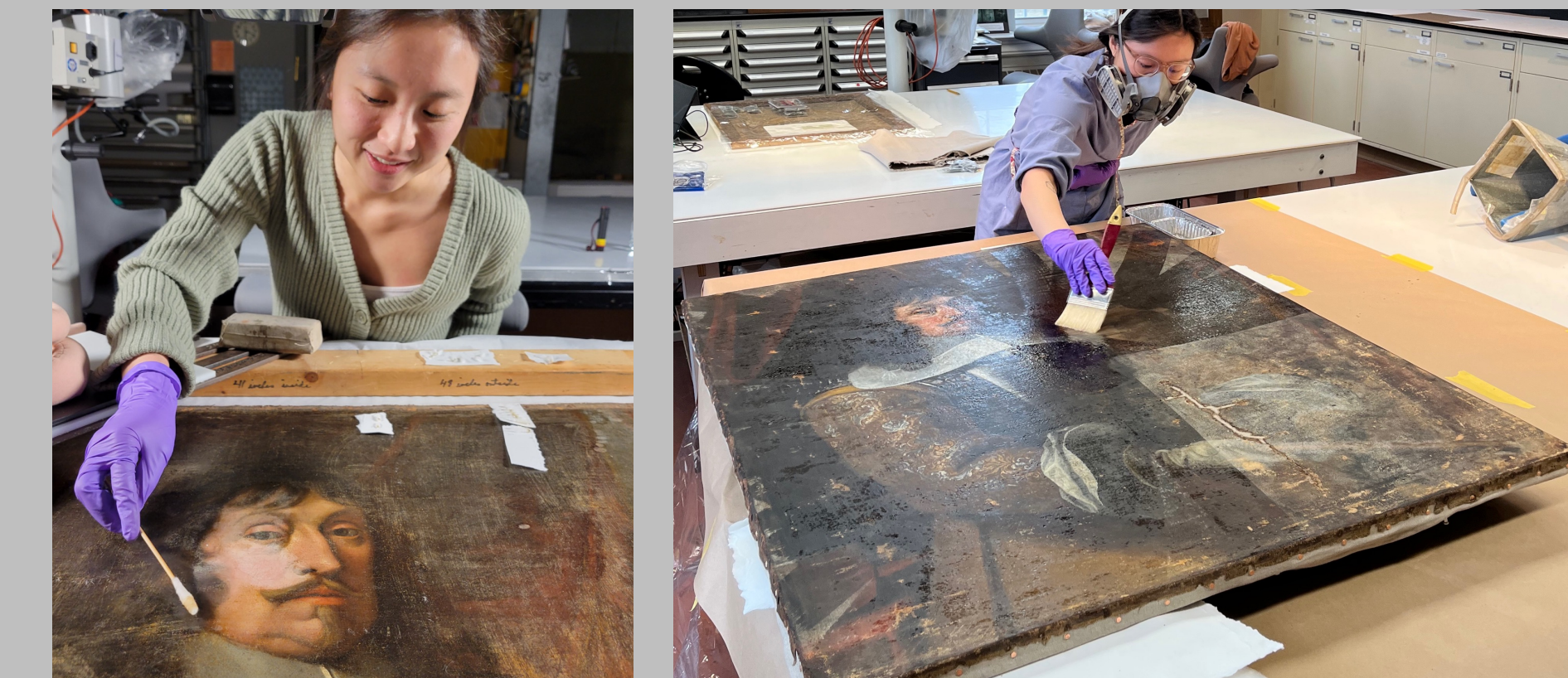
- Surface cleaning, dry and aqueous.
- Varnish and overpaint removal using isopropanol, ethanol, and acetone mixtures.
- Removal of old fill material from major tear.
- Paint consolidation with BEVA® 371 in solution.
- Filling with BEVA®371 fills (BEVA, chalk, pigment mixture), Flugger, and Beckers Latexspackel.
- Varnishing with Laropal A81 + Tinuvin 292 (brush & spray).
- Inpainting with stable dry pigments and Galdehyde.



Fig. 15: During Inpainting.



Fig. 16: Spray application of varnish.



Figs. 13-14: Removing aged varnish (left); brushing initial varnish application (right).

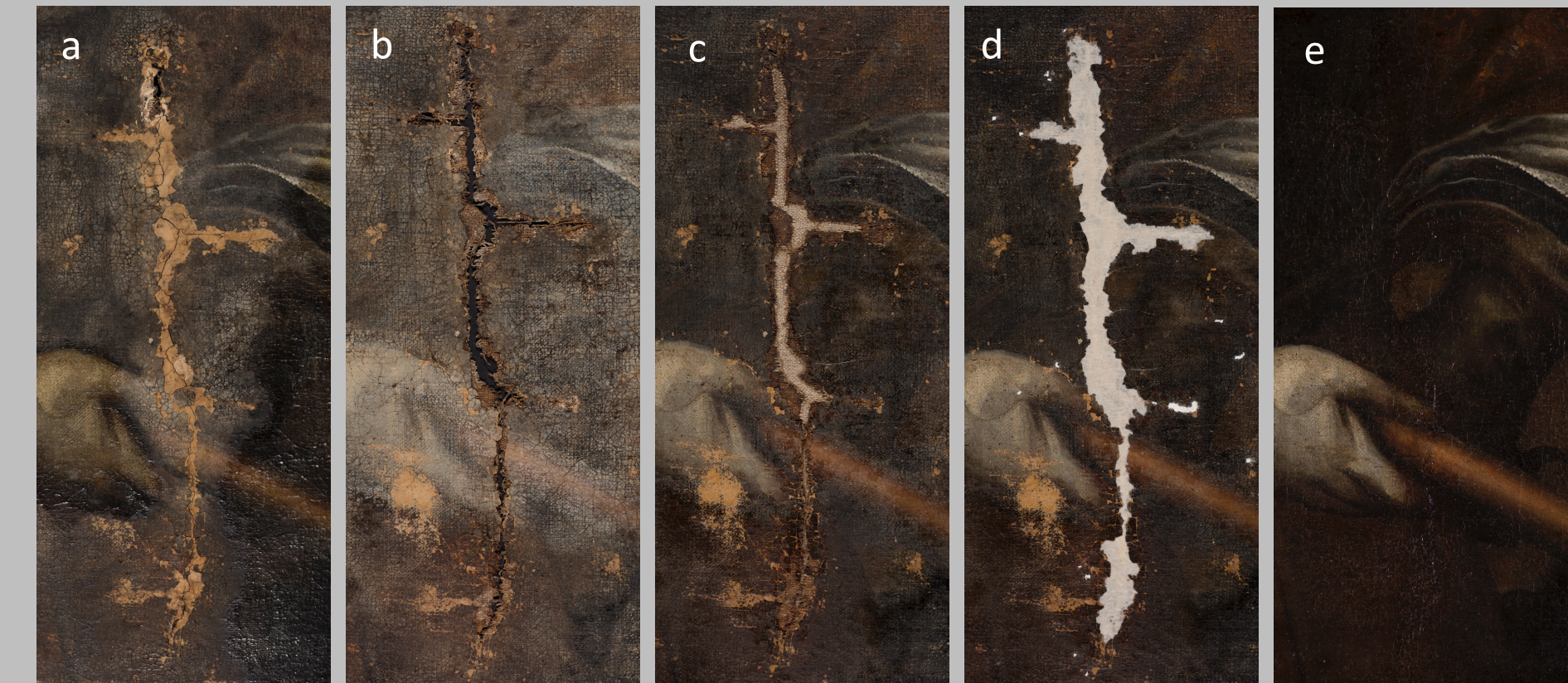


Fig. 17: Detail of treatment of major tear. Left to right: varnish and overpaint removed (a), old fill removed (b), repaired tear (c), filled (d), after treatment (e).

Reflections on using BEVA® 371a Film during Lining

- The latest BEVA® formulation 371a film, produced from 2021 to now, was purchased from TALAS online and was employed for lining.
- Practical concerns that impacted the current treatment were noted:
 - higher activation temperature (~65-70°C) was needed for a secure bond, which may not be achievable or suitable for many paintings;
 - BEVA®371a film seemed less tacky at room temp than BEVA®371b;
 - adhesion of lining was impacted by solvent exposure during initial brush varnish, resulting in pockets of separation occurring at interface of BEVA® 371a film and original canvas;
 - re-heating of lining on hot table was needed to re-establish intended bond;
 - raised the question of logistics surrounding removability.
- Additional studies are needed for better understanding of temperature required for bond strengths, solubility, & removability. Practitioners should be aware of possible practical changes related to the re-formulation.

Version	BEVA® 371 (1976-2009, original)	BEVA® 371b (2009-2021)	BEVA® 371a (2021-on)
Ingredients*:			
Polymer	Elvax®150	Elvax®150	Elvax®150
Polymer	A-C400	A-C400	A-C400
Tackifier	Laropal®K80	TegoVaripplus	Laropal®A81
Plasticizer	Cellolyn™ 21	Cellolyn™ 21	Cellolyn™ 21
Wax	Paraffin wax	Paraffin wax	Paraffin wax
Color	Clear	Clear/yellowish	Clear
Tack	Significant tack at 55°C, larger tack window	Significant tack at 60- 65°C, narrower tack window	Unknown, appears to be >65°C based on treatment

Table 1: Summary of ingredients, color, and tack of the three formulations of BEVA®371. *Data obtained for Beva® 371 and 371b from Ploeger, Rebecca, et al. "Original and Reformulated BEVA® 371: Composition and Assessment as a Consolidant for Painted Surfaces." *Studies in Conservation*, vol. 60, no. 4, 2015, pp. 217-26; data for 371a obtained from Talas Online.

Conclusions

The treatment was successful and the painting is now able to be safely displayed. Results from technical analysis indicated that the materials, including pigments and preparation techniques, were consistent with 17th c. Dutch painting styles. Challenges experienced during the lining process demonstrate the impact of the adhesive properties of BEVA®371a, the current formulation on the market. Additional studies are needed to determine treatment impacts. It is hoped that this case study may contribute to ongoing discussions in the field on practical implications of BEVA®371a film.

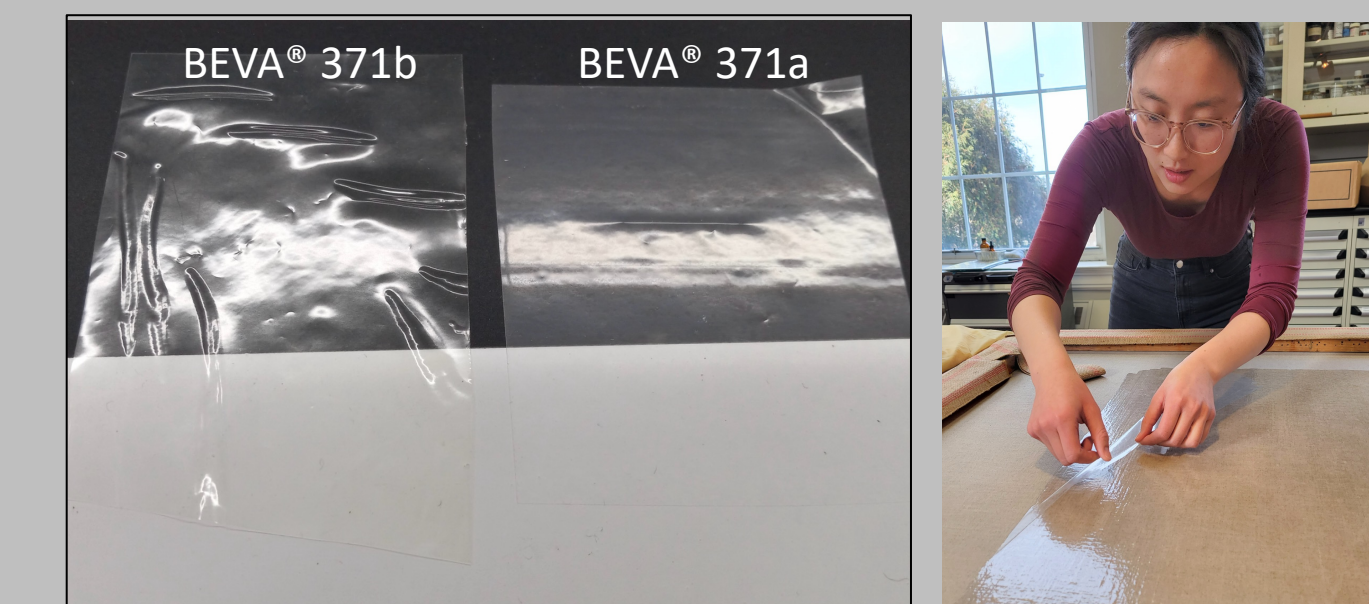


Fig. 18: BEVA® 371b (left) and 371a (right) films. Note slight yellowish color of 371b related to the resin.



Fig. 19: Preparation of the lining canvas.



Figs. 20-21: One layer of 2.5 mil BEVA®371a on lining canvas before (left) and after (right) adhesion. Performed two rounds of heat and pressure on the vacuum table. Saturation occurred during second heating after increasing the temperature past 65°C to secure the first failed bond.



Figs. 22-23: Before inpainting (left) and after treatment (right).

Acknowledgments

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