



## Icon Chantry Library Subject Bibliography

### No. 3 Adhesives in Textile Conservation

*A select annotated bibliography of references about Adhesives in Textile Conservation, compiled by Karen Thompson*



THE INSTITUTE OF CONSERVATION

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The aim of the Chantry Library Subject Bibliographies is to support the work of Icon members, by providing an up-to-date list of the most relevant source material on a topic in conservation with annotations giving information about the relevance, accuracy and quality of the sources cited, making it easier to evaluate the literature on a given subject.

The Bibliographies have been compiled by recognized specialists, who have selected the key works in their field of specialism.

This bibliography, the third in our series, provides a compilation of selected references about the use of adhesives in textile conservation. Drawing on specialist knowledge from research and best practice at the Centre for Textile Conservation at the University of Glasgow, the references reflect much of the current thinking and issues in this area of expertise and specialism.

## CONFERENCE PAPERS

1. *Symposium 2011: Adhesives and Consolidants for Conservation: Research and Applications*, October 2011 (Ottawa: CCI (Canadian Conservation Institute), 2011).

This covers the use of adhesives across all disciplines and includes a group of papers that specifically relate to textiles covering current practice as well as reviews of past practice.

Papers, posters and demonstrations available to download online:

<http://www.cci-icc.gc.ca/symposium/2011/index-eng.aspx> (accessed 5th February 2014)

2. *Adhesive Treatments Revisited: Postprints of UKIC Textile Section Third Adhesives Forum* edited by Jane Lewis, held at the Museum of London November 1997. UKIC (United Kingdom Institute for Conservation of Historic and Artistic Works) (London: UKIC, 1997).

This was the third adhesives forum organised by the UKIC Textile Section. There are a good range of case histories that primarily relate to support treatments for textiles. It also includes some papers that discuss the quality of the films produced and ageing of adhesives.

Reference: MAG Chantry: ICON:Conf/UKIC-1997

3. *Starch Pastes and Other Carbohydrate Adhesives for use in Textile Conservation: Adhesives forum II*, 2 November 1994. UKIC (United Kingdom Institute for Conservation of Historic and Artistic Works) (UKIC Textile Section: Museum of London, 1994).

This includes papers which describe the properties of the starch paste and carbohydrate adhesives and their preparation methods as well as a good range of case histories.

Reference: MAG Chantry: ICON:Conf/UKIC-1994

## MONOGRAPHS

4. Horie, V., *Materials for Conservation: Organic Consolidants, Adhesives and Coatings*, 2nd ed. (Oxford: Butterworth-Heinemann, 2010).

The updated version of this publication provides conservators with a useful resource for anyone working with adhesives. A description of the physical processes of adhesion and consolidation and a survey of the different polymers, which includes polyvinyl acetates, acrylics, and polymers derived from cellulose among others, are clearly explained. Terms that conservators encounter when reading about adhesives, such as glass transition temperature (Tg), are included in a glossary. The chemical and physical properties of different types of adhesive used in conservation, including their solubility parameters, provide an invaluable reference source.

Reference: MAG Chantry: ICON:SC/Hor

5. Tímár-Balázs, A., and D. Eastop, *Chemical Principles of Textile Conservation* (Oxford: Butterworth-Heinemann, 1998).

'Chemical Principles of Textile Conservation' brings together, from many sources, the material science necessary to understand the properties, deterioration and investigation of textile artefacts and includes chapters on the use of adhesives and consolidants. The theory is shown in practice with illustrated with case histories. This is an invaluable resource to have close to hand.

British Library inter-library loan if required

## JOURNAL ARTICLES AND CONFERENCE PAPERS

These have been grouped according to theme:

### The science of adhesives and testing

6. Down, Jane, Maureen MacDonald, Jean Tetreault, and R.Scott Williams. "Adhesive Testing at the Canadian Conservation Institute: An Evaluation of Selected Poly (Vinyl Acetate) and Acrylic Adhesives." *Studies in Conservation* 41, no. 1 (1996): 19–44.

The effects of dark and light ageing, pH, yellowing, flexibility and strength of polyvinyl acetate (PVAC) adhesives and acrylic adhesives were compared based on testing initiated in 1983 (outlined in a paper at the IIC Paris Congress, 1984). The tests and results are outlined in this paper. A useful review of the properties of these main groups of adhesives still widely used in textile conservation is provided. Although some of the adhesives tested have been superseded by other PVACs, some of them are still used by textile conservators including BEVA 371 and Lascaux 360HV.

Reference: MAG Chantry: J/Stu

7. Karsten, Irene, and Jane Down. "The Effect of Adhesive Concentration, Reactivation Time, and Pressure on the Peel Strength of Heat and Solvent-Activated Lascaux 360/498 Hv Bonds to Silk." In *Pre-prints of the ICOM CC 14th Triennial The Hague 12–16 September 2005*, 927–35: London: James & James Publishers, 2005.

The properties of this acrylic adhesive combination at different concentrations and using different methods of reactivation are examined. As part of this research, the effects of different application methods are assessed. The paper includes a useful discussion of the properties of films; continuous films are compared with ones that only coat the yarns. Some of the tests employed could be used by conservators in their own labs to assess adhesive properties.

Reference: MAG Chantry: Conf/ICOM - 2005

8. Karsten, Irene, and Nancy Kerr. "Peel Strength of Silk and Nylon Textiles Adhered to Sheer Support Fabrics" In *Symposium 2011, Adhesives and Consolidants for Conservation: Research and Applications: Proceedings CCI Symposium Paper 21*. Ottawa, Canada, 2011.

<http://www.cci-icc.gc.ca/symposium/2011/index-eng.aspx> (accessed 5th February 2014)

Six adhesives were tested: Acryloid F10, Beva 371, Clariant T1601, Dur-O-Set, Lascaux 360/498 HV, Vinamul 3252. The relationship between concentration and peel strength, brush versus spray, effects of the artefact and different support fabrics on the peel strength, transfer of the adhesive during peeling as well as the differences between adhesives were compared. The relationship between flexibility and bond strength was discussed. Useful analysis of findings identified how concentration of adhesives affected how the fabric was coated. This paper helps provide a better understanding of how an adhesive contributes to bond strength.

9. Karsten, Irene F., and Nancy Kerr. "The Properties and Light Stability of Silk Adhered to Sheer Silk and Polyester Support Fabrics with Poly(Vinyl Acetate) Copolymer Adhesives." *Studies in Conservation* 47, no. 3 (2002): 195-210.

Light ageing, colour change, stiffness and tensile strength of two PVACs on two different support fabrics were compared. Although the findings are specific to these two adhesives, and these products may not be widely used in the UK, some more general issues relating to PVACs come from the research. Other factors that may be applicable more widely include yellowing of the adhesive and fabrics due to light ageing, understanding of some of the reasons for increased stiffness with the application of the adhesive support and how the adhesive support affects the strength of the laminate (supported artefact). The research provides useful data on the adhesives tested but also addresses some of the factors to consider to when choosing an adhesive support treatment.

Reference: MAG Chantry: J/Stu

## Reviews of past treatments and case histories

10. Gill, Kate, and Foekje Boersma. "Solvent Reactivation of Hydroxypropyl Cellulose (Klucel G) in Textile Conservation: Recent Developments." *The Conservator* 21 (1997): 12–20.

Three case histories are described including the testing involved to determine the most effective concentration and method of reactivation of Klucel G®. Each case history describes the object, its condition and conservation needs before going on to outline the testing carried out and the rationale behind it, and finally the method of application. The cases histories include objects with different needs and consequently three different solutions were chosen. The paper highlights the versatility of adhesive application, the potential for varying the method of reactivation as well as the value of testing to determine the most appropriate application for each object. It provides a useful starting point for working with this adhesive and consideration of methods of reactivation.

Reference: MAG Chantry: J/Con

11. Hillyer, Lynda, Zenzie Tinker, and Poppy Singer. "Evaluating the Use of Adhesives in Textile Conservation. Part 1: An Overview and Survey of Current Use." *The Conservator* 21 (1997): 37–47.

This paper provides a useful insight into the use of adhesives in textile conservation in the mid 1990s and some historical context, the basis of which informs the use of many adhesive techniques today. The article contextualises the use of adhesives in textile conservation, popular adhesive choices and substrates and reasons that influence the choice of adhesive. It demonstrates how, in part, the choice of adhesive had been affected by the studio in which a conservator trained and/or practised: different studios preferred different adhesives.

Reference: MAG Chantry: J/Con

**12.** Hillyer, Linda. "Advances in Adhesive Techniques - the Conservation of Two Coptic Tunics at the Victoria and Albert Museum." In *Textile Conservation: Advances in Practice*, edited by Frances Lennard and Patricia Ewer, (Oxford: Elsevier, 2010): 181–88.

This paper reviews two adhesive support treatments carried out in 1986 and 1996. A description of the objects, their condition and adhesive treatments used is included. Hillyer reflects on these treatments and discusses how changes in practice lead to different treatment approaches for the tunic treated in 1986. However, developments in practice by the early 1990s meant that the one treated in 1996 has withstood the test of time well. Hillyer considers why treatments have failed and how developments in communication and collaboration with colleagues from different disciplines have facilitated developments in practice.

**Reference:** MAG Chantry: ICON:TX/Len

**13.** Kite, Marion, and Pauline Webber. "The Conservation of an English Embroidered Picture Using an Oriental Paper Method: A Joint Approach." *The Conservator*, no. 19 (1995): 29–35.

Kite and Webber describe how they adapted a paper technique to support a fragile embroidered textile with water sensitive dyes. They used Japanese paper and wheat starch and provide a detailed explanation of their choice of method and adhesive. They also provide a detailed description of the technique carried out which could be adopted and developed by other conservators. This is a technique that has subsequently been successfully used at the V&A on other textile objects and further articles have been published on this work.

**Reference:** MAG Chantry: J/Con

**14.** Lennard, Frances, and Vivian Lochhead. "United We Stand! The Conservation of Trade Union Banners. Tales in Textiles, the Conservation of Flags and Other Symbolic Textiles." In *North American Textile Conservation Conference*, 111–18. New York, 2003.

Lennard and Lochhead compare and contrast the conservation treatments of trade union banners carried out at the Textile Conservation Centre and People's History Museum. It provides a brief discussion of the context of banners and mention of one prolific banner maker, George Tutill. Typical problems associated with this type of object are described. The paper goes on to illustrate the different conservation approaches which are in part historical and influenced by the different clients' needs. It includes case histories which include details of the different materials and adhesives used.

**Conference paper available from Chantry Library on request**

**15.** Pretzel, Boris. "Evaluating the Use of Adhesives in Textile Conservation. Part 2 – Tests and Evaluation Matrix." *The Conservator*, 21 (1997): 48–58.

This forms Part 2 to the review paper by Hillyer, Tinker and Singer (1997). This paper compares the mechanical and chemical properties of a range of adhesives. It discusses the main factors conservators use in making an adhesive choice. Although a number of the adhesives used in this research are no longer used by textile conservators or are no longer in production, this paper is useful as it provides a comparison of properties that are important to consider and this approach can be extended to compare the adhesives currently available. As part of this study, the influence of application technique and support materials were also evaluated. Pretzel described the matrix that was developed to score adhesive properties; this was dependent on the object's needs rather than a direct comparison of adhesives. This matrix provides a useful method that conservators could use to help make informed choices.

**Reference:** MAG Chantry: J/Con

**16.** Thompson, Joel, and Masumi Kataoki. "From Mummies to Modern Dress: Adhesive Treatments in Textile Conservation at the Museum of Fine Arts, Boston." Paper presented at the *Adhesives and Consolidants for conservation: Research and Applications, Symposium 2011, Canadian Conservation Institute, Ottawa, Canada, 17–21 October 2011.*

<http://www.cci-icc.gc.ca/symposium/2011/index-eng.aspx> (accessed 5th February 2014)

Seven case histories on a wide range of textile artefacts which have involved the use of a number of different adhesives are described. In each case history the decision making process, providing some insight into the reasons for the choices of particular adhesives, as well as the practical applications are discussed. It provides examples of the types of adhesives currently used in many textile conservation labs including wheat starch, methylcellulose, Klucel G, Lascaux (360HV & 498HV) with both fabric and paper substrates. It includes examples where the properties of some of the adhesives were modified by mixing two different adhesives.

**17.** Tinker, Zenie. "Pragmatism with Past Adhesive Treatments" In *Proceedings of Symposium 2011 – Adhesives and Consolidants for Conservation, October 17-21 Ottawa, Canada: CCI, 2011.*

<http://www.cci-icc.gc.ca/symposium/2011/index-eng.aspx> (accessed 5th February 2014)

Reversal and retreatment of adhesive supported textiles are discussed and the rationale for further treatment is discussed. This article illustrates the decision making processes involved and compares case histories. It highlights how different factors (choice of adhesive, object and support material and application method) impacted on the re-treatments.

## Adhesives used for the consolidation of painted textiles

**18.** Foskett, Sarah. "An Investigation into the Properties of Isinglass." *SSCR* 5, no. 4 (1994): 11–14.

Research carried out as part of the final year investigation project for the three year Post-graduate Diploma in Textile Conservation provides a useful introduction into the properties and preparation methods of isinglass (a gelatinous substance derived from the collagen of fish swim bladders) which is used in textile conservation primarily for the consolidation of paint. In the paper, the chemical properties of isinglass are discussed and four different isinglass products are compared. The pH, viscosity and gelling properties were considered as were different methods of preparation based on current literature. The film properties, including appearance, handling, elasticity and flexibility, were also compared. Foskett identified a preparation method that produced satisfactory results overall and highlights how the different grades of isinglass affect the properties of the gel. Further details of the project can be found in Foskett's report housed at the Centre for Textile Conservation, University of Glasgow.

**Reference:** MAG Chantry: J/SSCR

**19.** Haupt, Margaret, Deborah Dyer, and Jim Hanlan. "An Investigation into Three Animal Glues." *The Conservator* 14 (1990): 10–16.

The properties of three animal glues (rabbit skin glue, gelatine and isinglass) were compared. Their pH, surface tension, viscosity, film strength, flexibility and the effects of RH were studied. This paper highlights how the physical and mechanical properties vary with the type of glue and the way it is prepared. The properties of isinglass were particularly interesting as this is used by textile conservators in the consolidation of painted textiles. This provides a useful adjunct to the work by Foskett.

**Reference:** MAG Chantry: J/Con

20. McLeod, Miriam. "Powdery Paint: The Use of Funori with an Indian Jain Painting." In *Taking the rough with the smooth: Issues and solutions for decorated surfaces*, edited by Alison Fairhurst, Victoria and Albert Museum, (London: ICON Textile Group, 2012): 17–25.

The consolidation of powdery paint using Funori is described. The paper outlines the testing carried out to find a suitable application method to apply the consolidant. Adaption of an ultra-sonic humidifier provided an effective means to apply a consolidant as a mist. The materials, testing and technique are described. The technique described provides another means by which textile conservators can effectively apply consolidant to matt powdery paints.

Reference: MAG Chantry: Icon:Conf/ICON – 2012

21. Michel, Françoise. "Funori and Junfunori: Two Related Consolidants with Surprising Properties." Paper presented at the Adhesives and Consolidants for conservation: Research and Applications, *Symposium 2011*, Canadian Conservation Institute, Ottawa, Canada, 17–21 October 2011.

<http://www.cci-icc.gc.ca/symposium/2011/index-eng.aspx> (accessed 5th February 2014)

Funori/JunFunori (red algae genus) are alternatives to aqueous consolidants such as gelatine, sturgeon glue, hydroxypropylcellulose (Klucel E) and methyl cellulose (Methocel MC). JunFunori was developed as a pure version of Funori because of the variations in the product from different suppliers although a change in manufacture of JunFunori has also led to some variation in the quality of the product. This paper describes the source of the substance and the methods of preparation of funori and JunFunori. It includes two case histories which describe the use of JunFunori as a consolidant and cleaning agent and raises awareness of the problems of inconsistent/changing production issues which affect many products used in conservation. Good quality Funori/JunFunori has been found to be an effective consolidant for matt powder paint and this paper provides a starting point for conservators who may be interested in exploring its use with textiles.

## WEB RESOURCES

22. Victoria and Albert Museum: V&A Conservation Journal [online]

This online conservation journal from the V&A includes an interesting range of articles detailing conservation treatments carried out.

<http://www.vam.ac.uk/content/articles/c/conservation-journal-online/>  
(accessed 5th February 2014)

23. American Institute of Conservation: 'Theory of Adhesion' [online]

Theory of Adhesion is clearly and simply presented in this Powerpoint produced by the AIC.

[http://cool.conservation-us.org/byform/tutorials/conscitut/adhesion/adhesion\\_main.html](http://cool.conservation-us.org/byform/tutorials/conscitut/adhesion/adhesion_main.html)  
(accessed 5th February 2014)

## Biography

### Karen Thompson

Karen Thompson (ACR, FHEA) gained the Postgraduate Diploma in Textile Conservation from the Textile Conservation Centre (TCC) and the Courtauld Institute of Art in 1993. She has held posts in a number of different conservation organisations in the UK and abroad, including the National Museums of Scotland and the People's History Museum. She worked in the Conservation Services department of the Textile Conservation Centre (TCC) at the University of Southampton for 10 years. She now teaches on the MPhil Textile Conservation at the University of Glasgow. Her research interests include painted textiles and costume.

All the references are available for access either electronically, or in hard copy, via the Chantry Library, where original documents will be held.

For further details, contact

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