Canvas Bonding with Adhesive Meshes

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Introduction

A new approach allows the use of water-soluble adhesives for joining canvases by lowering the introduction of moisture: *Adhesive meshes* consist of pure binding media – gelatine, sturgeon glue or methyl cellulose – in the form of a very fine and flexible grid (Fig. 1), which is applied dry and activated with a minimal amount of water. So far, this technique has been successfully implemented for strip lining and re-adhesion of detached canvas layers of lined paintings **[1]**.

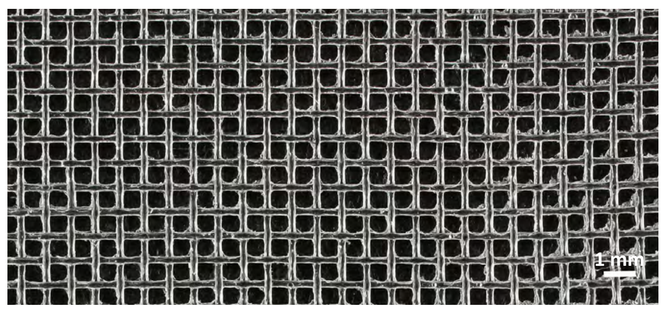

Fig. 1: Close-up of adhesive mesh made of sturgeon glue

Advantages

- selectable adhesive (Fig. 2)
- no penetration, stiffening or staining of textiles
- thin and uniform adhesive mesh structure
- adjustable adhesive strength
- bonding of interfaces that are difficult to access
- improved permeability and reversibility of the adhesive bond

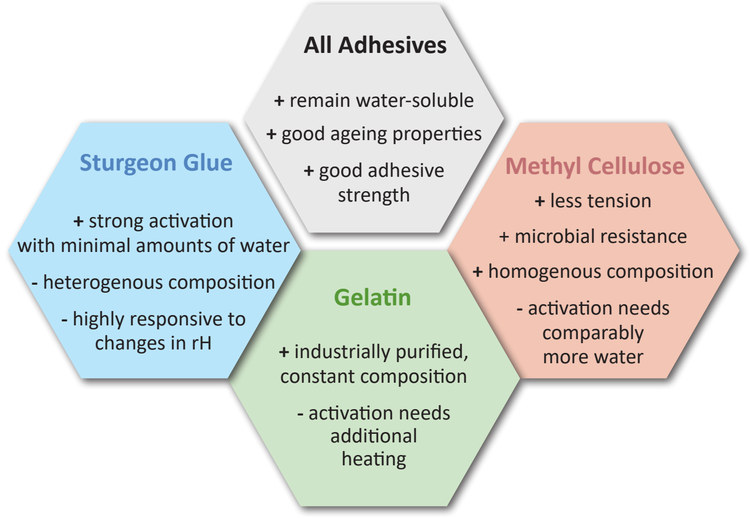

Fig. 2: Relevant properties of chosen adhesives

Manufacturing

A silicone mould made from kneadable two-component silicone rubber with the imprint of a polyester monofilament mesh (Fig. 3) is filled with aqueous 20% adhesive solutions in gelled form. Sturgeon glue gel **[2]** and gelatin gel **[3]** need to be pressed through a fine mesh filter prior to being introduced into the mould. During the entire process, the glues need to be kept tightly below their gelling temperature (19.5°C for sturgeon glue and 29.5°C for gelatin) and must not liquefy. The highly viscous methyl cellulose gel **[4]** is processed at room temperature. The procedure is carried out according to Fig. 4 and 5.

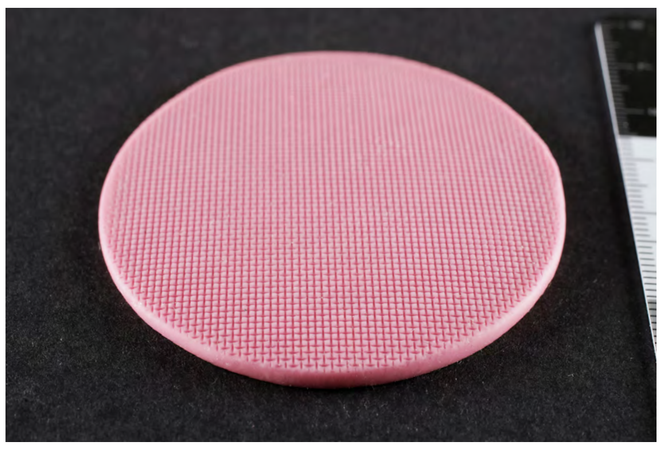

Fig. 3: Silicone mould, made with a polyester mesh of 600 µm mesh width

Fig. 4: Introduction of adhesive gel with a spatula and scraper

Fig. 5: Removal of a completely dried adhesive mesh

Application

For activation, adhesive meshes are positioned in the joint and moistened in situ. Water spray is useful for fully accessible joints (e.g. for strip lining), while a capillary non-woven fabric (Paraprint® OL 60) proved suitable for introduction into narrow gaps (e.g. detached lining, Fig. 6). The non-woven fabric is placed on top of the adhesive mesh between the canvas layers. Then water is given dropwise onto a protruding edge, causing a fast wetting of the adhesive. (Fig. 7) Upon activation and immediate removal of the non-woven fabric, the bonding is formed by applying pressure until the glue has solidified. Additional heat (approx. 35°C) can increase the bond strength.

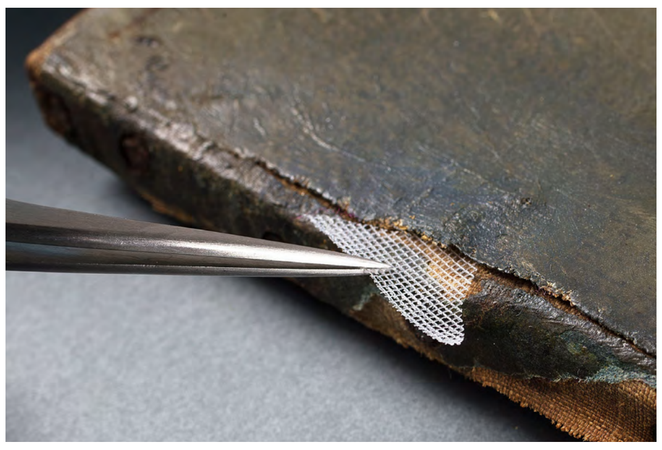

Fig. 6: Fitting an adhesive mesh between detached canvas layers

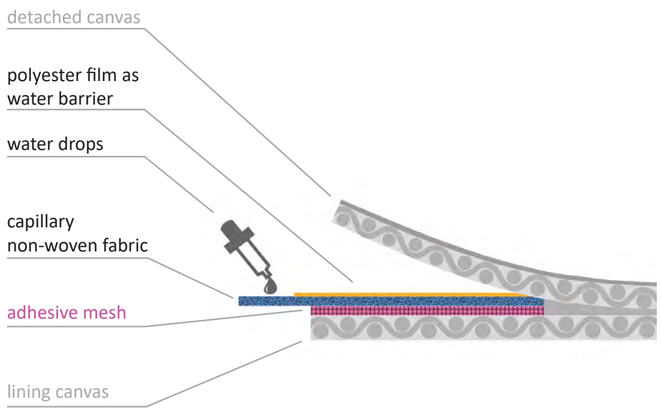

Fig. 7: Activation of adhesive meshes in detached canvas layers

Conclusion & Prospect

Water-based adhesive meshes are a promising alternative to currently popular ready-made lining glue compositions involving substantial heat input or the application of solvents. This technique fulfills strict conservation requirements while enabling the choice of a suitable adhesive according to an artwork's demands as well as a convenient handling. Further research will include acrylic adhesives, investigate controllable activation systems and the range of bonding applications for conservation treatments.

References

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[3] type A, 180 Bloom, Carl Roth GmbH & Co. KG
[4] Benecel™ A4C, Kremer Pigmente GmbH & Co. KG

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