

Lascaux Celluloses, Starches, Polysaccharides

Tyloses

Base

Methyl hydroxyl ethyl cellulose

Available:

Tylose MH 300 P2, low viscosity, powder
Tylose MH 1000 P2, medium viscosity, powder
Tylose MH 10000 P2, high viscosity, powder
Tylose MH 15000 YG8, high viscosity, granules
Tylose MH 300, ready-to-use adhesives

Properties

- chemically neutral and reversible
- very good resistance to biological and chemical decomposition
- nontoxic
- constant pH value
- completely transparent when dry
- reversible with water

Cellulose ethers form colloidal and polydisperse suspensions in water. The viscosity level is determined by the degree of polymerization, which is why the viscosity of a solution rises steeply with increasing concentration. Viscosity declines with increasing temperature.

The figures indicate the viscosity stages of the various types of Tylose and correspond to the viscosities of a 2% aqueous solution at 20°C.

Solubility

Soluble in water.

Preparation

P types: These types tend to clump, it is therefore better to disperse them in part of hot water.

YG types: The slow-swelling YG type can be dispersed easily in water (pH 7) without clumping. The dissolving process can be speeded up by setting a pH of about 8 to 9 after the Tylose has been dispersed in water. Cellulose ethers are virtually without bacteria and are resistant to micro-organisms. It is nevertheless advisable to preserve aqueous solutions which are kept for extended periods.

Application

Used as adhesive, sizing, binder, thickener, dispersing agent, water retention agent, stabilisers etc.

Safety

Please observe safety information on the safety data sheet.

Storage

Keep containers closed, when not using the product. Keep in a cool and dry place.

Size

Plastic jars in 500 g

Klucel

Base

Hydroxypropylcellulose

Available:

Klucel E, low viscosity, powder
Klucel G, medium viscosity, powder

Properties

- chemically neutral and reversible
- very good resistance to biological and chemical decomposition
- nontoxic
- constant pH value
- completely transparent when dry
- reversible with water and ethanol

Uses

Soluble in water and ethanol

Preparation

a) with cold water

Add the Klucel powder into cold water by gently stirring it (water temperature should not exceed 38° C (F), Klucel is insoluble in warm water over 46° C). Slow stirring guarantees an even mixture of powder and water. Continue the stirring until a homogeneous solution is obtained. The ratio of powder to water depends on the desired work to be carried out: 1 to 30 g powders (or more if required) per liter of water is generally needed.

b) with Ethanol

For the preparation of the glue-solution Ethanol is best used. The ethanol is warmed up in a water bath and Klucel is added slowly in the desired concentration (1g to 30g per liter Ethanol). The mixture is set aside and let to rest. It is recommended to prepare only small amounts of the mixture, which can be stored in glass containers.

Application

b) with Ethanol

The application of Klucel in alcoholic solution is recommended for linings of delicate papers:

- lining of transparent paper
- hinges made from Japanese paper

- strengthening of weak-points on the back of graphics
- strengthening of weak and missing pages (for example without taking the book apart)
- restoration of documents with ferric-gambia ink

Such strengthenings should be undertaken as follows:

- apply japanese paper on the back of the document
- coat the japanese paper with the prepared alcohol- / Klucel-solution
- the glue-solution should penetrate the japanese paper, to obtain the necessary adhesion

Safety

Please observe safety information on the safety data sheet.

Storage

Keep containers closed, when not using the product. Keep in a cool and dry place.

Size

Plastic jars in 500 g

Zin Shofu

Base

Precipitated wheat starch.

Properties

- chemically neutral and reversible
- very good resistance to biological and chemical decomposition
- nontoxic
- constant pH value
- completely transparent when dry
- reversible with water

Manufactured by Nakamura & Co. specialized in precipitated wheat starch for several generations.

During manufacture of this high-quality wheat starch, the starch is precipitated out and the gluten removed. The wheat starch paste is therefore particularly fine and the reversibility as well as the resistance to microbial decomposition is increased.

Solubility

Soluble in water.

Preparation

Wheat starch paste is prepared in a ratio of 1:4 (1 part powder to 4 parts water). Combine the powder and water in a pot with an automatic stirring device (Seb, Téfal, etc). Boil over high heat for at least 1¼ hours, stirring continuously. Be sure to prepare a sufficient quantity (at least 7 dl, or about 1 ½ pints), as much of the liquid will evaporate when the mixture is boiled. When the time is up, pour the paste into a

receptacle that can be hermetically sealed. Close the receptacle and set it aside in a cool dark place - not a refrigerator - for 24 hours. Then sieve the required amount of paste through a fine straining cloth into a container. Using a short broad brush with a nonrusting ferrule, blend the mixture thoroughly to a smooth creamy consistency. This increases the bonding strength. If the paste is too thick, water may be added at this stage. Apply the paste thinly to avoid cockling. Preparations of wheat starch paste will keep for up to 4 days. Avoid the use of fungicides at all costs: latest research indicates that adhesives containing fungicides darken with age. Consistency and amount required are a matter of experience and depend on the type of object. Best results are obtained by applying the paste as sparingly as possible in a thin dry layer.

Safety

Please observe safety information on the safety data sheet.

Storage

Keep containers closed, when not using the product. Keep in a cool and dry place.

Literature

Olivier Masson / Véronique Strasser
Le montage et l'encadrement d'oeuvres d'art sur papier
Published by Cabinet des estampes du Musée d'art et d'histoire, Genève Schweizerischer Verband für Konservierung und Restaurierung

Size

Buckets in 1.5 kg

Lascaux JunFunori®

In the last few years **Funori**, a Japanese glue extracted from the red algae genus *Gloiopeltis*, has become known to conservators as an especially suitable product for the consolidation of matt paint.

Funori is a natural product and therefore of variable quality. To solve this problem the Institute for the Preservation of Monuments and Historic Buildings at the Swiss Federal Institute of Technology Zurich (ETH), the Swiss Federal Materials Science and Technology Research Institution (EMPA) and the Centre for Conservation at the Swiss National Museum pooled their research work to develop a special purifying treatment.

The result is **JunFunori** (Jun = pure), a standardised product which has been produced and tested by experts over a period of many years. With JunFunori conservators now have at their disposal an improved product to consolidate matt paint without altering the appearance of the paint surface.

JunFunori is now manufactured exclusively by Lascaux.



Composition

Water-soluble polysaccharide, extracted from the red algae genus *Gloiopeltis furcata*, which grows along the Pacific coastline of Japan, China and Korea.

Applications

JunFunori is particularly well suited for consolidating matt powdering paint layers. It has excellent optical properties and stands out from other Funori grades available in the trade by virtue of its very high quality and purity.

Besides its application as a consolidant JunFunori can also be used with good results as a facing and retouching agent, also in combination with sturgeon glue as binder in chalk fillings.

Processing

a) Recipe

Dissolve 1 g of JunFunori in 100 ml of cold water. Stir in a water bath at $\pm 55^{\circ}\text{C}$ for several hours until JunFunori

is fully dissolved. Make sure the receptacle is stirred regularly during the dissolving process so that any undissolved particles are rinsed off its sides. A smooth flowing solution indicates that JunFunori is fully dissolved.

b) Concentration

The basic solution of 1 weight per cent is very viscous and can be diluted depending on the intended use. In each case the correct concentration has to be determined by testing. Although one might expect a 1 weight per cent solution to be too weak, the adhesive force is sufficient for most applications. If not, the consolidation treatment can be repeated. Concentrations higher than 1.5 weight per cent may no longer dissolve fully.

Notes

JunFunori can also be applied using an aerosol generator, ideally with the AGS 2000 HS aerosol generator from Lascaux. It has been shown empirically that concentrations of 0.1 – 0.15% can be vaporised in an aerosol generator, without the admixture of alcohol.

c) Treatment and storage of the solution

Always add alcohol to the adhesive solution if it is to be stored over a longer period. Measurements have shown that a traditional Funori solution stored in a refrigerator and treated by adding isopropyl alcohol still had the same adhesive strength after 70 days. Without the admixture of alcohol the solution decays within a matter of days, producing a characteristic mouldy odour. The quantity and type of alcohol used should be chosen according to the sensitivity of the surface to be treated; do not add alcohol if in any doubt. For objects sensitive to alcohol apply a new alcohol-free solution every two to three days.

For insensitive surfaces the admixture of 2 percent by volume of isopropyl alcohol has been tried and tested. The isopropyl alcohol works as a biocide and surface-active agent in the solution.

As JunFunori precipitates in pure isopropyl alcohol, caution is required when adding higher alcohol concentrations.

It is therefore recommended to add the alcohol drop by

drop and to stir the solution regularly. Adding too much alcohol at once causes a localised increase in viscosity. Smearing occur, which can be dissolved through additional stirring.

The JunFunori solution can be applied cold as it does not gel at room temperature. Warm application is recommended nonetheless as the solution achieves a better penetration due to its lower viscosity.

d) Modification of the JunFunori solution

Usually the adhesive strength of JunFunori is sufficient to consolidate powdering paint layers. Sturgeon glue can be added to improve adhesive strength, for instance for reattaching flaking paint. This also improves the penetration of the algae product. JunFunori acts as a thickener, preventing the sturgeon glue from being absorbed into the substrates. With its excellent optical properties JunFunori also prevents the typical build-up of tide marks or the darkening of the paint layers caused by the sturgeon glue.

To consolidate flaking paint a solution of 4 weight per cent of sturgeon glue was mixed with a JunFunori solution (1 weight per cent in water with 2 per cent by volume of isopropyl alcohol) in a ratio of 1:4 up to 1:1. The ratio depended in each case on the thickness, tension and sensitivity of the paint layers.

Packaging

In powder form of 1, 2 and 3 g

Further reading:

Funori-Kompressen, Oberflächenreinigung und Reduzierung von Wasserrändern, Françoise Michel, Anita Wanner, Robert Tobler, *Restauro*, Issue 5, 2006

Studies on the polysaccharide JunFunori used to consolidate matt paint, Thomas Geiger, Françoise Michel, *IIC, Studies in Conservation*, Vol. 50 No. 3, 2005

Konsolidierung mit JunFunori, Michaela Ritter, Olivier Masson, *Papier Restaurierung*, 2005, Vol. 6

Fräulein Huth and the red seaweed: Consolidation of a collage by Kurt Schwitters with JunFunori, Olivier Masson, Michaela Ritter, *The Paper Conservator*, Volume 28, 2004

Anwendungsbeispiele auf matter Malerei, Françoise Michel, *Zeitschrift für Kunsttechnologie und Konservierung*, 2003 Issue 2

Funori, ein japanisches Festigungsmittel für matte Malerei, Françoise Michel, Thomas Geiger, Anita Reichlin, Genevieve Theo-Sapkota, *Zeitschrift für Kunsttechnologie und Konservierung*, 2002 Issue 16

Disclaimer:

The information provided above is given to the best of our knowledge and is based on our current research and experience. It does not absolve the artist from the responsibility of first testing the suitability of our products for the substrate and specific use conditions he or she has in mind. This technical sheet will become invalid with any revised edition. The latest update is always found on our website.