

Application of JunFunori®

Funori, a Japanese glue extracted from the red algae genus *Gloiopeltis*, has in the last few years 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. A purifying treatment has been developed at EMPA to solve this problem. Thus **JunFunori**, a standardized product extracted from red algae species *Gloiopeltis furcata*, has been produced and tested. With **JunFunori** conservators now have an improved product to consolidate matt paint without any resulting change in the appearance of the surface at their disposal.

As for all other adhesives, a good consolidation depends on the material composition of the work of art and on a well-adapted application method.

1 Recipe

1 g of JunFunori is dissolved in 100 ml water (40°-45°C). It has to be stirred intensively in the water bath at 40°- 45°C. The dissolution of JunFunori in a magnetic stirrer takes about 2 hours.

2 Concentration

This basic solution of 1 wt% is very viscous. Depending on the purpose of use it has to be diluted. In each case the best concentration has to be evaluated by testing. Contrary to the all expectations that 1 wt% seems to be a very weak concentration, these solutions in most cases are absolutely sufficient. Otherwise the consolidation treatment can be repeated. Higher concentrations than 1.5 wt% might dissolve imperfectly.

Important: Since JunFunori is a macromolecule, only concentrations of 0.1 - 0.15 wt% were able to produce an aerosol in the ultrasonic mister.

3 Treatment and storage of solution

Always add 5 vol% of isopropyl alcohol to the solutions and store it in the fridge. In higher alcohol concentration JunFunori can precipitate. The isopropyl alcohol works as biocide and as surface-active agent. Measuring showed that a solution with an addition of 5 vol% isopropyl alcohol stored in the fridge still had the same adhesive strength even after 7 weeks. Without alcohol the solution will decay within a few days (mouldy smell). To achieve a better penetration the JunFunori solution is applied warmly (40°- 45°C).

4 Modification of JunFunori-Solution

Usually the adhesive strength of JunFunori is sufficient to consolidate powdering paint layers. For the reattaching of flaking paint, the adhesive strength of JunFunori can be improved by adding some sturgeon glue. That also facilitates the penetration of the algae

product. JunFunori acts as a thickener to prevent the sturgeon glue from being absorbed into the substrates. And due to its excellent optical properties, it prevents the typical building up of tide marks and darkening of the consolidated paint layer caused by the sturgeon glue.

In the consolidation of flaking paint a basic solutions of 3 and 4 wt% of sturgeon glue were mixed with JunFunori (1 wt%, 5 vol% isop. alc.) at a ratio of 1:4 up to 1:1 depending on the thickness, the tension and the sensitivity of the paint layer.

5 Examples of application

Consolidation tests were made on completely unbound pigment layers on canvas and wood. Moreover two African masks (matt paint on wood and raphia fabric), an over-moulded (stucco) skull of ancestor from Papua New Guinea, matt painted plywood (casein-tempera) and glue-bound distemper on stucco were consolidated successfully with JunFunori and mixtures of JunFunori and sturgeon glue.

Depending on the material composition of the object different application methods were chosen. Whenever possible JunFunori was applied through thin Japanese paper by a paint brush. If the paint layer was too sensitive the ultrasonic mister was used. If wetting of the paint layer was convenient that was done with aerosol and with injections of 75 v% of isopropyl alcohol in deionised water.

Beside the application of JunFunori as consolidant it was also used with good results as facing and retouching agent, for tear repair in combination with sturgeon glue in the and as binder in chalk-fillings.

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The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properties of the product.