**Consolidation of Flaking Media**

**Definition**

Flaking media is a problem suffered by objects with thick layers of paint. The damage is as a result of poor adhesion between support and media or between different paint layers. The damage is best treated using the traditional brush method, where a consolidant is introduced between the detaching flake and its substrate by means of a fine brush.

**Method**

1. **Choice of consolidant**

A consolidant is nothing but a very diluted adhesive and therefore the choice is quite broad. Gelatin and its more pure form *Isinglass* have been and are employed widely due to their strong adhesive power, even when applied at low percentages.

Cellulose ethers such as methyl cellulose or ethyl hydroxethyl cellulose (known as Bermocoll®) have also been employed extensively as consolidation agents. They have the advantage of immunity to biologic attack.

Fu-nori, a traditional see-weed adhesive from Japan, has been introduced more recently in paper conservation. It yields one of the most matt films among all consolidants and it is specially useful for matt light colours.

Paraloid® is one of the most widely employed products when a solvent-based consolidant is called for. It can be dissolved in a wide variety of solvents, among which toluene and acetone.
## Consolidants and their concentrations

<table>
<thead>
<tr>
<th>Consolidant</th>
<th>Group</th>
<th>Concentration</th>
<th>Solvent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isinglass</td>
<td>Animal</td>
<td>1 %</td>
<td>Water + 5 % ethanol</td>
</tr>
<tr>
<td>Gelatine</td>
<td>Animal</td>
<td>2 %</td>
<td>Water + 5 % ethanol</td>
</tr>
<tr>
<td>Fu-nori</td>
<td>Vegetal</td>
<td>3 %</td>
<td>Water + 5 % ethanol</td>
</tr>
<tr>
<td>Methyl Cellulose</td>
<td>Cellulose ether</td>
<td>1 %</td>
<td>Water + 10 % ethanol</td>
</tr>
<tr>
<td>Ethyl Hydroxiethyl Cellulose</td>
<td>Cellulose ether</td>
<td>2 %</td>
<td>Water + 5 % ethanol</td>
</tr>
<tr>
<td>Hydroxypropyl Cellulose (Klucel-G)</td>
<td>Cellulose ether</td>
<td>2 %</td>
<td>Ethanol</td>
</tr>
<tr>
<td>Polyvinyl Acetate (Paraloid B 72)</td>
<td>Acrylic resin</td>
<td>2%</td>
<td>Toluene or Aceton</td>
</tr>
</tbody>
</table>

## Preparation of consolidants

**GELATIN**

1) Weight 2 gr. of gelatin granules or sheet fragments on an electronic balance.
2) Mix the gelatin with 100 ml of distilled water.
3) Let it stand for at least 30 min.
4) Heat the mixture in a double boiler at no more than 70°C, until all gelatin goes into solution. Stir while heating.
5) Add 5 ml of ethanol. Apply warm.
6) Store solution 2 %. Add 100 ml of distilled water to use it for several (1%).

**BERMOCOLL®**

1) Take 100 ml of distilled water, add 2 gr. of BERMOCOLL® (BERMOCOLL B 72) while constant stirring.
2) Stir solution thoroughly for 1 h. You can use a magnetic stirrer if available.
3) Let it cool down overnight.
4) Add 3 ml of ethanol to reduce viscosity. Resulting solution 2 %. Add 100 ml of distilled water to use it for several (1%).

**FU-NORI**

1) Tear fu-nori sheets into small fragments. Discard the darkest fragments.
2) Weight 3 gr. of fu-nori fragments on a balance and add 100 ml of distilled water.
3) Let it stand overnight.
4) Cook the mixture in a double boiler until the mucilage dissolves completely (approx. 30 min.). Do not rise temperature above 80°C.
5) Strain solution through cotton. Resulting fu-nori is 3%. Add 100 ml of distilled water and 10 ml ethanol to use it at 0°C (75 °C).

Does not get an iodine. Keep in refrigerator. Warm up prior to use.
**Warning!**

- Please note that the localised method explained herein is adapted for media that is **flaking**, that is, reasonably chunks of paint layer underneath which the consolidant can be introduced with a brush. When media lost the chemical cohesion of the binder and becomes **powdery** there are better alternatives such as the application of a consolidant by means of an ultrasonic mister.

**Further Reading**