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# Which Gelatine to use? - The choices for conservators.

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## Properties of gelatine

There are many varieties of gelatine available which are defined by grade/quality and (Table 1).

### Bloom value = strength of a gel

50 – 300 Bloom are commercially available.

- Strength: The greater the Bloom value, the stronger the gel.  
In theory, a 1 % solution of 200 Bloom gelatine would therefore produce a mixture of equivalent strength to that of a 2% 100 Bloom gelatine the higher the Bloom, the lower the gelatine concentration required to produce a mixture of given strength.
- Viscosity: The viscosity increases with increasing Bloom and decreasing temperature.

### Type = manufacturing method

Type A is produced under acidic hydrolysis, whereas Type B is produced under alkaline

- pH: The general belief that a gelatine solution of Type A is acidic and that of Type B is alkaline is incorrect (Table 1).
- Viscosity: Type B is more viscous than Type A at a given Bloom value, concentration and temperature.
- Strength: Type A is stronger than Type B at a given Bloom value and concentration of gelatine.



Figure above: Map of the estate of William Windham in Earsham with view of Hall, 139 x 106 cm, Norfolk Record Office, MEA 3/632.

Product name	Grade	Form	Origin	Type	Bloom	pH 1	pH 2
Gelita (Restora#on 2)	Photographic	Coarse particles	Pig skin	A	280	5.6(6.67%, 60 °C)	5.6
Gelita (Restora#on 1)	Photographic	Coarse particles	Bones	B	250	4.9-5.2(6.67%, 60 °C)	5.3
Dr Oetker Select Fine Leaf Gelatine Platinum grade	Food	Leaf	Pig	A	230	5.2	5.7
Gelita (1-2269)	Food	Powder	Beef skin	B	225	5.7 (6.67%, 60 °C)	6.0
Sigma G9391	Calf Culture	Powder	Bovine skin	B	225	5.9-7.5(1.5%, 25 °C)	5.4
TMSTAR gelatine powder LR (GE 2812)	Technical	Powder	Cattle hide/bone	B	160	5-6	6.1
Dr Oetker Gelatine	Food	Powder	Hide of beef	n/a	150	n/a	5.9
G Costa & Co Ltd, Fine leaf gelatine	Food	Leaf	Pig skin	A	125 - 155	4.70-5.70(6.67%, 60 °C)	5.4
Kremer G9391	Technical	Leaf	Pig skin	A	125 - 155	4.5 - 6.0	4.8
Gelita NOVOTEC GP	Technical	Coarse particles	Limed bone	B	~80	n/a	6.3

Table 1: Product information of 10 gelatines  
pH 1: Followed by the suppliers' information  
pH 2: pH of all solutions were determined by a pH meter (The pHep® HANNA® instruments HI98107, measurement range pH 0.0 – 14.0, accuracy ± pH 0.1) at 4.0 %, 25 ± 1°C (pH 7.6).

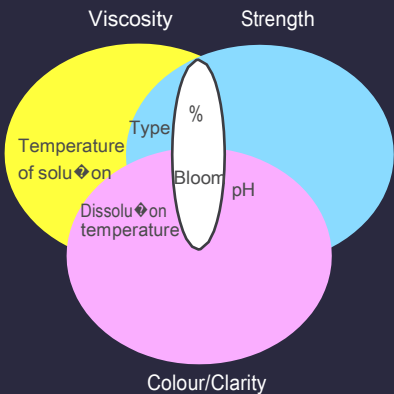


Chart 1: gelatine parameter

### Summary of the key properties of gelatine

Chart 1 illustrates how individual aspects correlate with the key properties of gelatine, summarising the complex nature of it. Manipulating one aspect of gelatine can alter the behaviour of the entire system.

## Application for archive repair



Figure 1: Sieving gelatine gel

### 1. Aerated gelatine mousse

Gelatine solutions are left at room temperature in order to obtain a gel. The gelatine gel is passed through a fine sieve to obtain a smooth mousse-like texture (Fig.1 and 2). The gelatine mousse is applied with a stencil sponge.

Advantages:

- Control over the mobility of the adhesive.
- Minimises the amount of adhesive applied as the volume of the gel increases by sieving.
- Potential for quicker drying than solution as more air is contained in the mousse than solution.
- Ease of application as smooth texture, similar to that of wheat starch paste, is obtained by sieving.

Possible disadvantage:

- May weaken the strength of the gelatine as three-dimensional molecular networks within the gelatine could be partially reduced to two-dimensional structures by the sieving action.

### 2. Example of application

This form works particularly well as an adhesive for parchment repair (Fig.2)

### 3. Summary of use

It is advisable to differentiate between gelatine types for specific applications:

- 1 % Type A gelatine, with relatively low Bloom (i.e. 100 Bloom) as a warm solution for consolidation.
- 3–5 % Type A gelatine with relatively high Bloom (i.e. 200 Bloom) in mousse state for treatment where strength is required, such as tear repair and infilling.



Figure 2: Treatment of an eighteenth-century parchment map made of four membranes. The joints formed by overlapping edges of membranes were partially detached. Using a palette knife, gelatine mousse (5% Type A with Bloom 230) was inserted into areas of detached joints.

## Conclusion

It is necessary to look at all the properties of a gelatine before considering its use: due to its complex nature, it is not appropriate to choose a gelatine based only on one property. A comprehensive knowledge of gelatine enables a more informed and considered approach to treatment such as tear repair and infilling.