

TECHNICAL NOTE NUMBER 202

FOREST PRODUCTS LABORATORY
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WATER-RESISTANT COLD PRESS BLOOD ALBUMIN GLUE

A formula and method of preparation for a highly water-resistant blood albumin glue developed at the Forest Products Laboratory, is given below. It may be used cold on the lighter weight woods or where high joint strength is not essential, but the application of heat is required to produce joints of uniformly high strength and to develop the full advantages of the glue. When hot pressed it is among the most water resistant of the wood-working glues.

The formula is as follows:

- 100 parts by weight of soluble blood albumin
- 140 to 200 parts by weight of water (according to glue consistency desired)
- 5½ parts by weight of ammonium hydroxide (sp. gr. 0.90)
- 15 parts by weight of paraformaldehyde

The blood albumin is covered with water and the mixture is allowed to stand for an hour or two. When it is stirred at the end of this period, the blood albumin will for the most part go into solution. The ammonium hydroxide is added with more stirring. Then the paraformaldehyde is added, and the mixture stirred constantly at a fairly high speed. Paraformaldehyde may be conveniently added in the form of a suspension in water, just enough water being added to the paraformaldehyde to form a "milk". The paraformaldehyde should not be poured in so rapidly as to form lumps nor so slowly that the mixture will thicken before the required amount has been added. After the paraformaldehyde has been

added the mixture will thicken to a firm jelly. It will become fluid again and reach a workable consistency in about an hour, remaining then in a workable condition for some 6 to 10 hours. When this glue finally hardens it cannot be dissolved again in water.

The glue may be applied by means of a brush or mechanical spreader.

Several precautions should be observed in mixing and applying this type of blood albumin glue:

1. Use fresh blood albumin and a "slow reacting type" of paraformaldehyde.
2. Weigh out all constituents.
3. Add water at room temperature and do not heat the mixture.
4. Do not stir the blood until it has soaked from 1 to 2 hours.
5. Avoid excessive stirring of the glue or agitation of the spreader, as this causes foamy glue.
6. In hot-pressing, temperatures above 212°F may lead to difficulties from blistering.
7. Use sufficient pressure to insure good contact but not enough to crush the wood.

The fact that cold press blood albumin glue will solidify under water indicates that the "setting" of this glue is a chemical reaction and not a result of evaporation.