

TECHNICAL NOTE NUMBER 202

FOREST PRODUCTS LABORATORY - U. S. FOREST SERVICE - MADISON, WISCONSIN

WATER-RESISTANT COLD PRESS BLOOD ALBUMIN GLUE

A formula and method of preparation for a highly water-resistant cold press blood albumin glue developed at the Forest Products Laboratory, is given below. This glue does not require hot pressing as do the older types of blood albumin glues, but is used in a cold press in the same manner as casein or vegetable glues. It can, however, be used in a hot press if the occasion demands. The improved glue can be used with success in the production of plywood and for gluing lumber of the species having low shearing strength, but in the stage of development which has produced the formula and preparation described here, it cannot be recommended for gluing thick veneer or lumber of heavy dense species. Further development may make the glue strong enough for use with all species. The glue shows a moisture resistance far superior to that of any glue in ordinary use at the time of its discovery.

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 trioxymethylene (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

trioxymethylene is sifted in, and the mixture stirred constantly at a fairly high speed. The trioxymethylene 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. Regardless of the manner in which the trioxymethylene is added the mixture will thicken considerably at this point. This thickened mass will become fluid again in a short time at ordinary room temperature and arrive at a good working consistency in about an hour, remaining in this condition for at least 6 or 8 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. Weigh out all constituents. Do not use volumetric measure.
2. Add water at room temperature and do not heat the mixture.
3. Do not stir the blood until it has soaked for from 1 to 2 hours.
4. Avoid excessive stirring of the glue or agitation of the spreader, as this causes foamy glue.
5. 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.