

# TECHNICAL NOTE NUMBER 193

UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

FOREST PRODUCTS LABORATORY

MADISON 5, WISCONSIN

REVISED

December 1952

---

## STARVED GLUE JOINTS

Many failures in glued wood products are caused by "starved" joints, or joints in which the film of glue between the wood surfaces is not continuous. Starved joints are readily identified by broken joints showing little or no wood failure or with little or no glue visible. Such joints, according to the Forest Products Laboratory, are not necessarily the result of a lack of glue spread on the wood; heavy spreads are as likely to produce them under ordinary commercial conditions as light spreads. They are caused rather by the application of pressure to the joint while the glue is too fluid.

Starved joints are more likely to occur with glues of low viscosity, such as warm animal glue, than with casein, vegetable, and other thick glues. Starved joints have also been observed with some of the thermosetting synthetic resin glues when short assembly periods and heavy pressures are combined with thin glue mixtures. Such thin mixtures may result from use of the mixed glue too soon after mixing.

Some woods are more susceptible to the production of starved joints than others. Birch, maple, red oak, and ash, which have open pores, absorb glue from the spread in such considerable amounts that they often leave the joints starved. Basswood and yellow-poplar also take up a great deal of glue, but weak joints are not very noticeable in these woods because the woods themselves are weak. Other woods with smaller cells open to the gluing surface do not seem to be so subject to starved joints.

In some cases starved joints may result from the use of wood containing too much moisture at the time of gluing. This has been observed frequently in the use of phenol-resin film glues and is likely to occur whenever wet wood is glued.

To avoid starved joints it is necessary to mix a glue solution thick or to allow it to thicken in the pot or on the wood before pressure is applied. When it is necessary to glue under conditions that might produce starved joints, the use of light pressure is advantageous.