
GLUES

History, Preparation, Use and Disassembly

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Der Seimmacher.
 Klebt mit Herk und Müd, an dem höchsten Güt.



Auß Seele soll der Schlamm der Erden,
 ein Saßer Seim der Flügeln werden,
 womit man sich zu Gott außschwingt?
 Entreiß dich von solchen Sachen,
 die uns nur zu Gefangnen machen,
 wann man nicht ihre List bezwingt.

The Gluemaker

GLUES: History, Preparation, Use and Disassembly

The violinmaker and the repairer need to know two general things about glue: first how to prepare and use it, and second, how to disassemble glue joints.

PRINCIPLES OF GLUING

It is helpful to understand how glue forms a bond between two pieces of wood. A glue joint holds by cohesion and adhesion. Cohesion is the intermolecular attractive force by which the glue holds itself together. Adhesion is the property which, by reason of intermolecular forces and proximity, glue is attracted to and clings to other matter, in this case, wood. For strong adhesion, the glue must enter into and cling to the wood at the cellular level in order to establish the necessary molecular proximity.

Water has a remarkable property known as hydrogen bonding, which causes it to be strongly attracted to nearby foreign molecules. Water grabs onto solids and advances into them whenever these are put into close contact, like water on a blotter, a paper towel, or wood. This means water-based glues, like hide glue, exhibit great capillarity and wetting properties, the hot water carrying the dissolved glue down into the pores of the wood. But if the wood pores, for example the tracheid cells, are clogged by old indissoluble PVA glue, the new glue is repelled and cannot achieve the wetting and/or penetration sufficient for optimum molecular adhesion, and the glue joint will be weakened.

The case of hide glue is far different. A joint made with hide glue can be repaired again and again and will be just as strong as the original. With hide glue it is possible to wash out completely all traces of old glue. This is because hide glue is completely miscible in hot water, and can be infinitely diluted, making complete washout and complete clean-up possible. Painstaking clean up of a hide glue joint is not required if hide glue is also to be used in the repaired joint. The reason is this: when new hot water-based hide glue is introduced into the joint, the old hide glue hidden deep in the joint crevices and wood pores softens and partially dissolves. The new and old glue mix into each other to form an indistinguishable bond, which is as strong as the original. No other common glue has this extraordinary characteristic.

TYPES OF GLUES

HIDE GLUE

1. History of Hide Glue

Three thousand years ago, the ancient Egyptians at Thebes made stone carvings depicting glue preparation and use, and used animal glue to build wooden funerary furniture for their pharaohs. But the origin and use of hide glue is lost in prehistory.

From the earliest history of the violin, beginning with the Cremonese and Brescian masters of the 16th century, hide glue has been the traditional glue used by violin makers. This is the conventional wisdom and is found in all the standard literature.

The first commercial manufacturing of hide glue in Europe dates from about the end of the 17th century in Holland.