

CONEJO VALLEY WOODWORKER'S ASSOCIATION

The Bladerunner

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Glues, Gluing and Clamping

This topic has always been a mystery among woodworkers. For some time Internet has had a series on glues, gluing and clamping. Below is some of the "dialog." If you are on Internet, this and other topics can be accessed through woodweb:
<http://www.woodweb.com>

A question was asked about clamping pressure. As a partial answer, let me provide the following information. The role of pressure when gluing is to spread the glue on both surfaces, developing a glue line thickness between 0.006 and 0.002 inches thick any thinner and there isn't enough glue; any thicker and the joint strength goes down. Pressure also squeezes out any extra glue-in fact a little squeeze out is a good thing from a visual quality aspect. Pressure does NOT squeeze glue into the wood; pressure does not affect the cure rate or joint strength (except as mentioned above).

With this concept of the role of pressure, then, most folks will shoot for 50 to 75 psi on the joint. Softer woods are more forgiving than harder woods. In any case, the wood surfaces to be glued must be perfectly mated, which is probably more important than the pressure. Perfect mating is achieved when we machine initially; but let the pieces sit around for an hour or two and if their moisture content changes, the surfaces won't be true anymore!

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Dear Prof. Wengert:

I appreciate your response to the posting on the clamping topic. I am, however, a little confused by some of the data you cited. I had been informed by our adhesive supplier, Franklin Titebond, that pressures of 100-250 were in order, given film thicknesses similar to those you wrote of. The product we generally use is Franklin Titebond 50, a production adhesive.

They informed us that the pressures were a function of the density of the materials being bonded, which roughly correlate to the common softwood/hardwood designations common in our industry. Specifically 100-150 psi for low density (softwoods, IPB, MDF), 150-200 psi for medium density, and 175-250 for high density. Interestingly, high pressure laminate to IPB is recommended at 50-75 psi, to minimize telegraphing.

Precision of fit is paramount, as you pointed out, but I would add that there are gap-filling adhesives, in aliphatics specifically, to contend with problem situations. This posting is not intended to contradict or refute your comments, but to further the discussion and assist in understanding of the dynamics of adhesives and clamping by all, including myself.

Thank you for your comments!

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Let me add further information with respect to clamping pressure.

My original statement included the statement that the ROLE of Pressure is not to squeeze glue into the wood. I did not mean to imply that glue doesn't go into the wood. But such penetration is not helpful in developing a good glue bond or strong joint. Therefore, my statement could have been more clearly stated as "it does no good to squeeze glue into the wood, and therefore that is not an objective of putting pressure on the joint." I have some excellent microscopic photos of wood cells and the glue distribution. So, the role of pressure is to squeeze glue into all the nooks and crannies, create a uniform film, etc. compress the high spots of the wood surfaces at the joint and thereby provide more of the wood surfaces within the 0.002 to 0.006 inch gap. (Some people go as high as 0.008 inches gap maximum.) A softer wood will compress more easily than a harder wood; hence the suggestions of higher pressures on higher density woods. But When the surfaces are not well mated (i.e., perfectly smooth), then pressure on the joint will my EXPERIENCE is that over 100 psi is excessive for North American woods; higher pressure is trying to correct for non-flat surfaces, but does so very poorly in many cases. (May I share a pet peeve? Get rid of all steel tapes that measure to 1/32-inch; get everyone micrometers or other devices that measure to 0.001 inches (or equivalent metric) and get true straight edges; etc.)

Some adhesives, most notably epoxy and hot melts, have excellent gap filling properties-that is, they have high strength even with a large gap. (But hot melts are not so strong and soften with heat.) (Note: When repairing a loose chair rung or other poor fitting joint, because the joint often has gaps over the 0.006 limit, we must use a strong, gap filling adhesive.) Except for hot melts and construction adhesives (rubber type cements), all glues used on

wood can provide a joint stronger than the wood itself!

Gene Wengert,

Discounts for Conejo Valley Woodworkers

The following businesses are offering discounts to members of the Conejo Valley Woodworkers' Association:

Mayan Hardwood, Inc.

Moving from the present location at
2930 N Los Olivos, Oxnard
to:3130 Paseo Nereado, Oxnard.
phone: 805-981-4555

More announcements coming!!!!

We Need Your Newsletter Inputs

Vendors that offer discounts to club members

Special topics or questions

Special local events,

Other items:

Newsletter Editor:

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Please contact Ira for submissions, suggestions, and comments. All inputs for the newsletter are needed by the 15th of the month before the meeting.

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