

Glue is a must for Strong Joints

Framing starts with neatly mitred corners, which are tightly joined and stay that way. No matter what kind of frame moulding is used, two elements are essential to achieve the desired result: glue and mechanical fasteners. Both serve an important purpose.

You can't rely on vee nails or other mechanical fastener alone to ensure that the corners remain tight. Without glue and with the passage of time the joints will eventually loosen. This occurs primarily from the natural expansion and contraction of the joint and from handling.

Mechanical fasteners such as vee nails should be considered as a mechanism to keep the joint closed and correctly positioned while the glue dries.

Wood is by far the most common material in the manufacture of modern picture frame moulding. It is easy to machine and cut and remain by far the material most favored by manufacturers and framers alike.



Early Wood Glues

There was a famous jockey that never lost a race. When asked how he achieved this, he replied, I whisper in the horse's ear: *Roses are red, violets are blue. Horses that lose are made into glue.*

Yes, that's right, it's no myth. Animal or horse glue was made from connective tissue, found in hoofs, bones, tendons, ligaments, and cartilage in vertebrate animals. I won't go into the finer details of how the glue was made. Suffice to say that Rendering plants took fat and bone trimmings from butcher stores, waste scraps from restaurants, and dead animals. They cooked the meat and fat products together and products like soap, various lubricants, and of course animal glue were produced. Modern glues have replaced animal glue as the preferred adhesive for the framing industry.

Modern Wood Glue

Polyvinyl acetate or PVA is a rubbery synthetic polymer. It is prepared by polymerization of vinyl acetate. Partial or complete hydrolysis of the polymer is used to prepare polyvinyl alcohol. Dr. Fritz Klatte discovered PVA in Germany in 1912. PVA, as an emulsion in water, is sold as an adhesive for porous materials, particularly wood. It is the most commonly used wood glue, both as "white glue" and the yellow "carpenter's glue", the former also used extensively to glue other materials like paper and cloth.

PVA glues are probably the most common adhesives on the market. They come in a variety of formulas, all ever so slightly different, and specific to what they are designed to glue. One thing you can be sure of is that in the right application they form a very strong and generally flexible bond with the wood's fibers that will last for many years, even with the stresses of expansion and contraction and handling.

Here are some tips for using PVAs.

- All PVAs are designed to work on porous materials only. Note that cutting hardwoods with a dull saw blade might result in a "glazed" surface, which reduces the glue's ability to form a strong joint.
- PVAs are water based and clean up with water.

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- PVA is only toxic to ingest, it does not emit any harmful fumes, and is not hazardous to touch.
- PVA sets best in good air circulation, at room temperature.
- PVAs work best when pressure is applied to the joint so consider clamping.
- Most PVAs are not waterproof. The yellow PVAs have a higher moisture resistance than the white ones, but neither are completely waterproof.
- Never allow your PVAs to freeze. This breaks down the polymers and your glue will be rendered useless!
- Yellow PVAs have a shorter shelf life than white PVAs.
- Although PVA is not a gap filler, in some cases you can add sawdust to it to increase its gap-filling ability.

Application

Apply the glue to the entire surface. Be aware that excess glue will squeeze out of the joint and will require removal. A slightly damp 12 or 25mm paintbrush is an ideal tool for removing the excess from crevices. You should test the surface of the moulding prior to joining to ensure that any colour wash does not wipe off during the clean up process.

To achieve the strongest joints, pre-glue. That is, apply a thin wipe of glue on each surface and leave it until it is only slightly tacky, then glue and join the corner normally. Pre-gluing seals the grain and prevents having a “starved” joint, in which the wood absorbs so much moisture from the glue that there isn’t enough left on the surfaces to create a strong bond.

Bonding process

Bonding will begin immediately when the joint is put together and the glue soaks into the timber grain. After a short period of time the joint can withstand gently handling. Remember however that any movement of the joint during this early stage may result in a weaker bond. Full strength is normally achieved from within a few hours to overnight depending on the brand being used. Close inspection of a failed PVA joint will normally show that the failure has occurred within the wood fibres rather than the glue.

Polystyrene Moulding

All framers, if they haven’t already, will eventually find themselves working with polystyrene moulding. Water-based glues commonly used for wood will not work on polystyrene moulding because the polystyrene is not as porous as timber. Glues favored for polystyrene moulding are cyanoacrylate adhesives.

Cyanoacrylate is the generic name for substances such as methyl-2-cyanoacrylate, which is typically sold under trademarks like Superglue. Cyanoacrylate adhesives are sometimes known as “instant adhesives”. The acronym “CA” is quite commonly used for industrial grades.

When gluing polystyrene, care must be taken to ensure that the glue does not ooze from the joint and become deposited on the surface of the frame. This will most certainly lead to permanent damage to the surface. So the important thing to remember is use the glue sparingly. Cyanoacrylate glues dry quickly and are available in several consistencies, such as “thin,” which is watery, and “gap filling,” which is a thick gel. Once the joint is fully cured it will generally be stronger than the plastic itself.

Mechanical fasteners and glue form the best partnership for holding the corners together during the early stages of cure. They allow moderate handling of the frame prior to the glue being fully cured and prevent catastrophic failure of the joint if the glue joint should break. Using the right glue for the job will result in frame joints which will please your customer and keep them coming back.

Note: Always refer to the manufacturer’s directions and safety information prior to use.

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