

INTRODUCTION TO WOODWORKING Adhesives

From the editors of
CANADIAN
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Considerations/Tips

Consider the Materials – Adhesives are formulated for a specific range of materials. Some are just for wood, while others are good for other materials such as metal, plastic, etc.

Adjust the Temperature – Some adhesives can't be applied while the project or air is cold, while others are less affected by the cold. If you're working in an unheated Canadian shop, this is a serious consideration.

Water Resistance – If your project will not come into contact with water (wall cabinets, chairs, etc.) or high levels of moisture (some bathroom projects), you won't need a waterproof adhesive. If your project is going to be subjected to repeated washings (a cutting board), or will regularly come into contact with water (an outdoor project or a shower seat), it's critical for the adhesive to be waterproof.

Open Assembly Time – This refers to the amount of time the adhesive can remain applied to the surface(s) of the joint and left alone before bringing the surfaces together. Short open assembly times (associated with CA adhesive) are as low as a few seconds, so almost instant. Long open assembly times (associated with 24-hour epoxy) are about an hour. Most PVA adhesives have an open assembly time of five to 10 minutes. Generally speaking, you want to bring the surfaces together quickly, but with large assemblies this isn't possible. Choosing an adhesive with a long open assembly time will give you more time during assembly.

Strength – Many adhesives are stronger than wood itself, while others are relatively weak (hot melt glue sticks, spray adhesives). High strength isn't needed in every situation. Some situations require different characteristics, so you have to weigh the pros and cons of an adhesive before selecting one.

Reversibility – Repairs are more easily made with adhesives that can be softened. A non-waterproof PVA glue can be softened with water, a hot melt glue can be softened with heat. Some niche adhesives, like hide glue, are used by some furniture restorers in order to make future restoration efforts easier.

PVA Glue

Commonly referred to as white glue, yellow glue or carpenter's glue, polyvinyl acetate (PVA) is the most common adhesive for furniture and general woodworking. There are many variations available which means there's an option for just about any woodworking project. Available in Type 1 (non-waterproof) as well as Type 2 and 3 (waterproof) options.

PROS: Easy to use; readily available; water cleanup; cost effective; no mixing necessary; waterproof versions available; strong wood-to-wood bond; relatively fast-drying; reasonably long shelf life

CONS: Shouldn't be used below freezing; weak or useless when used to bond some materials other than wood; doesn't work well with some oily / exotic wood

Polyurethane

A relative newcomer to the North American market, polyurethane adhesive is gaining popularity here. It has many beneficial characteristics, though it does work slightly differently than the more common PVA adhesives, which is likely why it has been slower to catch on. It's often used when a waterproof glue line is needed, or when bonding dissimilar materials, though it has other uses.

PROS: Great for joining dissimilar materials like wood to metal and plastic; waterproof; no mixing necessary; long open time; rigid glue line

CONS: Solvents are required for cleanup; can be messy as it foams when drying; if the material you're using is too dry, you need to brush water onto the joint immediately before assembly; generally cures slowly; shouldn't get on skin

Epoxy

Not an everyday adhesive for most woodworkers, epoxy is generally a niche product. Although it has recently gained a lot of popularity in the use of epoxy "river tables," there are many other uses for it in a woodworking shop. Its ability to fill gaps makes it great for when the faces of the materials don't mate perfectly or you need to fill a larger gap. Cure-times range from about five minutes to 24 hours.

PROS: Bonds most materials; fills gaps extremely well; 24-hour version has a long assembly time and is usually waterproof; can mix pigments into epoxy to create strong visual effects; can be purchased in different colours

CONS: Two-part product so it needs to be carefully measured and mixed before each use; doesn't accept stain; non-water cleanup; shouldn't get on skin

Cyanoacrylate (CA)

Cyanoacrylate is the generic name of this adhesive, while Super Glue and Krazy Glue are common brand names in this category. Available in many viscosities, cyanoacrylate (CA) glue is applied thinly, and will bond many types of materials quickly and strongly. CA adhesive is often used to fill small knot holes or voids in wood or to adhere pen tubes to pen blanks for turning, though it does have other uses. CA adhesives can be applied as a wood finish to smaller turnings while they're rotating on a lathe.

PROS: Very fast setting – as quickly as a few seconds; available in different viscosities; an accelerator can be used to speed curing; generally a one-part system

CONS: Will bond with skin; fairly short shelf life unless kept frozen



Hot Melt Glue Sticks

This adhesive is overlooked by many woodworkers, likely as they see it as more for kids' crafts. While it is used by kids, more heavy-duty models with better adhesive sticks can also be used by woodworkers in a wide range of shop situations. Often used as a temporary solution to keep something in place until the main adhesive cures or a more permanent connector is used. You can think of hot melt glue as a temporary clamp.

PROS: Sets quickly; adhesive sticks are available in a variety of melting temperatures, strengths, flexibilities, colours

CONS: Generally doesn't create a very strong and permanent bond; uniformity of glue sticks of the exact same type isn't always consistent



Urea Formaldehyde

Used mainly in industrial settings, but there's nothing saying hobby woodworkers can't use this two-part adhesive as well. In the right situation (veneering, bent laminations, etc.), urea formaldehyde adhesives can offer strong advantages. Because of certain health risks, it's important to wear proper safety protection when working with urea formaldehyde, especially the powder portion of this adhesive when it's in dry form.

PROS: Cures very rigid; fills gaps; long open time

CONS: Two-part adhesive that needs careful measurement and thorough mixing; powder portion of product is unhealthy if inhaled; usually not found locally

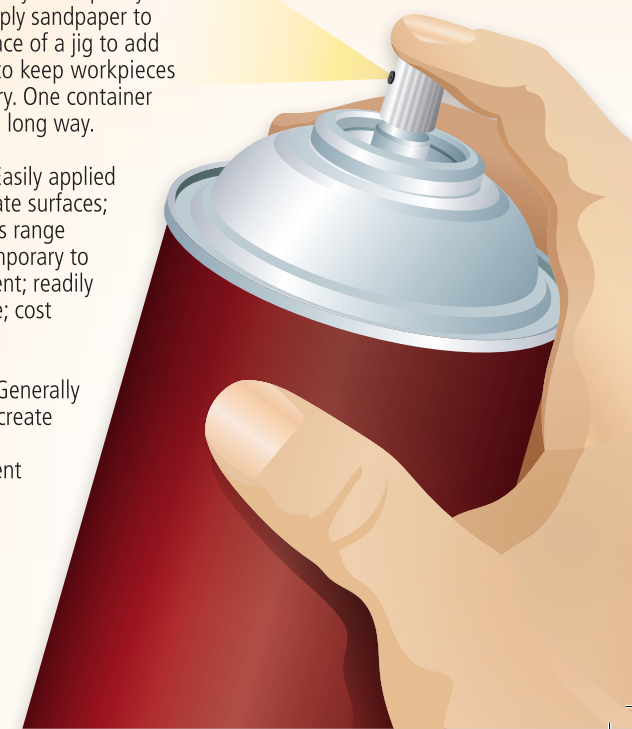


Spray Adhesives

When it comes to temporarily applying patterns or templates to solid wood or sheet goods, a spray adhesive is a great option. Scroll sawing, marquetry or even curved and patterned work will benefit from a spray adhesive. A spray adhesive will also allow you to quickly and easily apply sandpaper to the surface of a jig to add friction to keep workpieces stationary. One container will go a long way.

PROS: Easily applied to intricate surfaces; strengths range from temporary to permanent; readily available; cost effective

CONS: Generally doesn't create a strong permanent bond



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