



Wood Glues and Adhesives

There are many different glues and/or adhesives that are used in woodworking, each with their own advantages and disadvantages depending on what the woodworker is looking for. The intent of this document is to explain the advantages and disadvantages, or the Pro's and Con's for each type of glues and/or adhesives and let you, the reader, make an informed decision regarding which glue and/or adhesive is the **best** choice for different conditions.

As a note: There are some terms for glue and adhesive properties that need to be explained before digging into the details.

- This document will use the term *glue* for both *glues* and other *adhesive* types.
- Additionally, the word *dry* is used for both *drying* and *curing*.

Bonding Strength – Bonding strength is a measurement of just how strong the glue “seam” is. Now the good news is that virtually all modern glues are actually stronger than the surrounding wood fibers. In plain English the wood around the joint will fail before the glue does. As long as you have properly prepared, applied, and allowed the glue to dry.

Open time - Once you have applied the glue to the wood surfaces how long before the glue begins to “set” or harden. You will often see times listed such as 4-6 or 8 -10 minutes, please realize that as you extend the open time the glue doesn't instantly change, it is a gradual process. However, to achieve the **BEST**, results keep this time in mind.

Assembly Time –It's the amount of time that the work pieces can be moved prior to weakening the glue seam. as you extend the open time the glue doesn't instantly change, it is a gradual process. However, to achieve the **BEST**, results keep this time in mind.

Application Temperature -This is the recommended minimum temperature for both the wood and the glue. Throughout the entire glueing process. From application of the glue until fully dry or cured.

Interior – Inside of a building or structure where the materials bonded will not come into contact with moisture or significantly high humidity. As an example, a bathroom cabinet should not be considered interior space as it may encounter significant humidity.

Exterior (Weatherproof) – This is NOT waterproof; the materials might come into contact with moisture however the contact will not be prolonged, think in terms of minutes – not hours.

Exterior (Waterproof) – If the materials will be in contact with moisture for longer than minutes... then it is a waterproof application. To assist you in determining which glue to use, think about this situation. You decide to build a nice white oak bathroom cabinet to hang on the wall in your bathroom. Materials might cost in the neighborhood of maybe \$150.00. You might spend 25 hours working on the project. The price difference between a bottle of “Wood Glue” and a bottle of “Waterproof” is...\$2.00. “Wood Glue” for \$3.68 or \$5.68 for “Waterproof Wood Glue”. It is your call, is it worth it?

Joint Quality/Gap Filling – Are there any gaps between the two mating surfaces. Or, are the joining surfaces smooth and tight?

Shelf Life – Once opened, how long before it loses its ability to perform as advertised. Here again, you need to make that value decision. Is the project you are working on “worth” a new bottle of glue?

Drying / Curing Time – does it take a glue or other adhesive to dry or cure? It depends on the glue you are using. Epoxies generally have the longest cure times which can be several days. PVA and yellow glues have a shorter “fully cured” time. Generally, eight hours before removing clamps, and 24 hours before applying a full load on the joint.

**Listed in this document are the different types of
glues and adhesives used in woodworking**

Polyvinyl Acetate (PVA) - These are the most prevalent wood glues, suitable for indoor applications. They dry fairly clear, are easy to clean with water, before drying and are non-toxic. Examples include [Titebond Original™](#) and [Elmer's Carpenter's Wood Glue™](#).

Bonding Strength	Very Good
Open Time	10 – 15 Minutes
Assembly Time	4 – 6 Minutes
Application Temperature	50° F / 10° Degrees and above
Interior	Yes
Weatherproof	No
Waterproof	No
Joint Quality/Gap Filling	High required / Very poor gap filling properties
Shelf Life	1 – 2 Years in temperature stable environments

Aliphatic Resin (Yellow Glue) - Similar to PVA but with added heat and water resistance, aliphatic resin glues are favored for their quick setting time and strong initial tack. They're excellent for woodworking joints that require precise alignment. Examples include: [Titebond Premium™](#), [Titebond Ultimate™](#), and [DAP\(R\) Weldwood Original Wood Glue\(R\)](#).

Bonding Strength	Excellent
Open Time	10 – 15 Minutes
Assembly Time	3 – 5 Minutes
Application Temperature	55° F / 12 C° Degrees and above
Interior	Yes
Weatherproof	Yes
Waterproof	Yes – If waterproof is stated
Joint Quality/Gap Filling	High required / Very poor gap filling properties
Shelf Life	1 – 2 Years in temperature stable environments

Epoxy - A two-part adhesive known for its exceptional strength and gap-filling properties. Epoxy is suitable for bonding dissimilar materials and is often used in situations where maximum durability is required. Also known to be extremely waterproof. The curing times for epoxy can range from 5 minutes to over 24 hours. Examples include: [TOTALBOAT™](#) [Thixo™](#) and [SYSTEM THREE T-88®](#), [Quick Cure™ Epoxy](#).

Bonding Strength	Excellent
Open Time	Ranges from 2 minutes to several hours
Assembly Time	Ranges from 2 minutes to several hours
Application Temperature	50° F / 10° C Degrees and above
Interior	Yes
Weatherproof	Yes
Waterproof	Yes
Joint Quality/Gap Filling	NOT required / Excellent gap filling properties
Shelf Life	Several years when kept in stable temperature environments and unmixed

Polyurethane Glue - This glue expands as it cures, making it effective for bonding uneven surfaces. It's waterproof and suitable for outdoor projects, but the foaming action requires careful application to prevent mess. This adhesive is also very good at bonding dissimilar materials. However, polyurethane glue can be difficult to clean up both before and after curing. Examples include: [Gorilla Glue\(™\)](#).

Bonding Strength	Very Good
Open Time	Ranges from 15 - 30 minutes
Assembly Time	Ranges from 10-15 minutes
Application Temperature	50° F / 10° Degrees and above
Interior	Yes
Weatherproof	Yes
Waterproof	Yes
Joint Quality/Gap Filling	NOT required / Very Good gap filling properties
Shelf Life	12 – 24 months when kept in stable temperature environments.

Cyanoacrylate (CA) Glue - Also known as super glue, CA glue is perfect for quick repairs and small joints. It bonds rapidly however is brittle, so it's not recommended for load-bearing joints. Often will be used in conjunction with a spray [accelerator](#) which will speed the curing process to nearly instantons. Most manufactures produce different viscosities such as thin, medium, and thick. Examples include: [Starbond\(™\)](#), and [Titebond](#).

Bonding Strength	Very Good however can be brittle
Open Time	A few seconds
Assembly Time	A few seconds
Application Temperature	50° F / 10° C Degrees and above
Interior	Yes
Weatherproof	Yes
Waterproof	Yes
Joint Quality/Gap Filling	Required / Very little gap filling properties
Shelf Life	12 – 24 months when kept in stable temperature environments.

Hide Glue – The oldest woodworking glue and the main reason that many wooden antiques have survived intact. The glue’s ability to be “soften” and “rearden” makes it unique in the world of glues and adhesives. It is also prized for its ability to “lubricate” a wooden joint allowing for easy assembly. Traditional animal-based glue that's still used in fine woodworking and musical instrument making due to its reversibility and strong bond. Hide glues can be purchased as dry pellets/granules needing water and heat (approx. 140° F or 60° C) to mix, or as modern, stable liquid. Hide glues also offer a longer open time, making it more user-friendly for difficult glue-ups. Because hide glue is somewhat unknown here are some reasons to use hide glue.

- When assembling the glue will act like lubricant.
- PVAs and other glues can swell your work, and fast. Then when they dry, they shrink a bit. Which makes through joints somewhat trickier to get visually perfect.
- It is reversable, warm/hot water will soften the glue joint, allowing for disassembly.
- There is a variant that comes in a squeeze bottle, ready to use, so there’s no mixing and heating.

Bonding Strength	Excellent
Open Time	10 – 15 minutes – or - until glue cools
Assembly Time	10 – 15 minutes – or - until glue cools
Application Temperature	140° F / 60° C Degrees
Interior	Yes
Weatherproof	No
Waterproof	No
Joint Quality/Gap Filling	Required / Some gap filling properties
Shelf Life	Unlimited until mixed, when mixed can be reheated several times.

Summary:

- **For standard indoor furniture:** PVA and Aliphatic Resin (Yellow Glue) are the industry standards due to ease of use and strength.
- **For durability and outdoors:** Polyurethane and Epoxy are the go-to choices for moisture resistance and bonding "dissimilar" materials.
- **For specialty work:** Hide glue is preferred for restoration because it can be undone, while CA glue is best for temporary or small-scale fixes.