

## Wood Surface Preparation

- For best results, we recommend the moisture content of the wood be between 6-8% and the relative humidity between 40-50%. Because Titebond Polyurethane Glue needs moisture to cure, lightly dampen the joint with water before gluing. (Moisture content can be determined with a meter.)

- To prevent "stepped joints", it is important to ensure that all the wood has similar moisture content. This can be achieved by allowing the wood to acclimate or sit exposed in your shop for 7 – 14 days.

- When working with woods that are oily or high in tannic acid, wipe the joints with acetone before gluing. Acetone clears the contaminants from the wood pores on the bonding surface and dries quickly without leaving any residue. Sanding or planing the wood before gluing will also help create a good bonding surface.

- Care should be taken to ensure a tight fit between wood pieces with no saw marks and no burnishing of the surfaces to be glued.

## Clamping Guidelines

- Appropriate clamp pressure is essential for a successful bond. We recommend the following guidelines:

For softwoods (pine, poplar): 100-150 psi  
For medium density woods (cherry, soft maple): 150-200 psi  
For hardwoods (oak, birch): 200-300 psi

- Clamp time is dependent on wood species, moisture content and environmental conditions. For most of our wood glues, we recommend clamping an unstressed joint for a minimum of 30 minutes to one hour. Stressed joints, such as bent laminations, need to be clamped for 24 hours. Do not stress the new joint until totally cured - at least 24 hours. For Titebond Polyurethane Glue, we recommend clamping for at least 45 minutes. The glue is completely cured within 6 hours.

- Clamps should be positioned a minimum of 1 1/2" - 2" in from the sides and evenly spaced at 8" - 12" throughout the piece.

## Application Tips

- Allow projects glued up with water-based glues to dry for several days before sanding or planing. This allows the swollen wood on both sides of the bonded joint time to dry and shrink, thus preventing "sunken" joints.

- Do not use metal tools with any Titebond wood glue. While it will not adversely affect the strength of the glue, iron may contaminate the glue and darken the glue line.

- Apply a sufficient amount of glue to ensure adequate adhesion. You should experience glue coming from the joint or "squeeze out".

- Glue joint "squeeze out" may make the area around the joint difficult to stain. Although sanding the area will help, we recommend using masking tape to cover the areas that you do not want exposed to glue.

## Common Gluing Terms

### ANSI / HPVA

American National Standard Institute / Hardwood Plywood & Veneer Association

### Bond Strength

The unit load applied in tension, compression, flexure, peel, impact, cleavage or shear, that is required to break an adhesive assembly with failure occurring in or near the plane of the bond. Typically reported in pounds per square inch (psi).

### Clamp Time

The period of time that the substrates being glued together need to remain clamped.

### Closed Assembly Time

The period of time between putting the glued substrates together and clamping. This time allows for moving the pieces into their final position.

### Chalk Temperature

When glue dries, the loss of water pulls the adhesive particles together with enough force to form a continuous film. If the drying temperature is below a critical point, water evaporation is not sufficient to pull the particles together, leaving them in the joint. The dried film in the joint will appear whiter than normal. This is known as "chalking" and the critical temperature is the "chalk temperature." When chalking occurs, the glued joint loses strength and could result in a failed bond.

### Crackling

A faux finish that creates a weathered or "antique" appearance on wood substrates.

### Freeze-thaw Stability

The ability of a product to remain usable after it has been frozen and thawed. Some wood glue will have a "cottage cheese" look after freezing. If this happens, shake/stir glue to original form.

### Open Assembly Time

Period of time between initial glue application and putting the substrates together.

### Polyvinyl Acetate (PVA) Glue

Any glue consisting primarily of polyvinyl acetate polymer. This category includes most traditional white glues and more advanced yellow aliphatic resin glues. Although PVA glues can vary in strength, flexibility, water-resistance and sandability, they offer good performance, cleanup with water and are non-toxic. Because PVA glues tend to "creep", or slowly stretch under long-term loads, they are not recommended for structural applications.

### Porous Substrate

A substrate that is permeable by air, water, etc.

### Speed of Set

The rate at which an adhesive can build strength.

### Squeeze-out

Adhesive pressed out at the bond line due to pressure applied on the substrates.

### Starved Joint

A joint in which there is not enough glue for a proper bond to form.

### Stepped Joint

A joint in which there is a small change in height of adjacent pieces of wood caused by changes in moisture content.

### Storage Life

The period of time during which a packaged adhesive can be stored under specified temperature conditions and remain suitable for use.

### Sunken Joint

A joint where the wood at the joint is lower or has "sunken" when compared to the surrounding wood; caused by machining the piece before water from the glue has completely evaporated.

### Tack

The property of an adhesive that enables it to form a bond of measurable strength immediately after the adhesive and substrate are brought into contact under low pressure.

### Total Assembly Time

The period of time between the initial glue application and clamping.

### Volatile Organic Compound (VOC)

A compound of carbon which participates in atmospheric photochemical reactions. The VOC is a measured or calculated number that reflects the amount of volatile organic material that is released from a product as it dries.

**NOTE:** For more information, visit [www.titebond.com](http://www.titebond.com), select "Woodworking Glues" and click on the desired informational category.



Technical Support 1-800-347-4583  
Customer Service 1-800-669-4583  
[www.titebond.com](http://www.titebond.com)

**Franklin International**

2020 Bruck Street, Columbus, Ohio 43207



## Product & Application Technical Guide





## Titebond® III Ultimate Wood Glue

An advanced proprietary technology that offers the best possible performance in woodworking glues. This waterproof formula passes the ANSI/HPVA Type I water-resistance specification and offers superior bond strength, longer open assembly time and lower application temperature. Titebond III Ultimate Wood Glue is non-toxic, solvent free and cleans up with water – safer to use than traditional waterproof wood glues. It provides strong initial tack, sands easily without softening and is FDA approved for indirect food contact (cutting boards). Titebond III is the ultimate in wood glues – ideal for both interior and exterior applications.



## Titebond® II Premium Wood Glue

The first leading brand, one-part PVA wood glue to pass the ANSI/HPVA Type II water-resistance specification. Titebond II Premium Wood Glue is ideal for exterior woodworking projects, including outdoor furniture, birdhouses, planters, mailboxes and picnic tables. It offers strong initial tack, outstanding bond strength, fast speed of set and excellent sandability. Titebond II Premium Wood Glue is FDA approved for indirect food contact (cutting boards) and is ideal for radio-frequency (R-F) gluing systems. It is non-toxic, solvent free and cleans up with water. This formula is also available as Titebond II Dark Wood Glue, a dyed version for use with darker woods.



## Titebond® Polyurethane Liquid Glue

A professional-strength, waterproof formula specifically designed for a wide-range of applications. In addition to its superior wood-to-wood performance, it is ideal for metal, ceramic, most plastics, HPL, Corian®, stone and other porous/non-porous materials. Titebond Polyurethane Liquid Glue provides a longer open time than PVA glues, offers excellent sandability and is unaffected by finishes. As moisture causes the glue to foam, it has the ability to fill gaps and bridge irregularities in the substrates; however, it will not expand or contract in the joint once fully cured. It works well on exotic or “oily” woods and will not become brittle with age.

1-800-347-4583  
Technical Support  
www.titebond.com

## Questions & Answers

### What Is The Difference Between Type I & Type II Water-resistance?

Both of these tests are conducted using 6" x 6" birch laminates glued together to make three-ply plywood. The test for Type I is clearly more stringent than Type II, and involves boiling the glue bonds and testing the specimens while they are wet.

Type I testing involves cutting the 6" X 6" assemblies into 1" x 3" specimens, boiling them for 4 hours, then baking the specimens in a 145°F oven for 20 hours. They are boiled for an additional 4 hours, then immediately cooled using running water. The specimens are then sheared while still wet, and the bond must pass certain strength and wood failure requirements to pass the Type I specification.

Type II testing involves cutting the 6" X 6" assemblies into 2" x 5" specimens, soaking them for 4 hours, then baking the specimens in a 120°F oven for 19 hours. This is repeated for a total of three cycles, and the bond must not delaminate to pass the Type II specification.

### Are Titebond Glues Safe To Use?

Yes. Titebond Wood Glues are non-toxic, solvent free and produce no harmful fumes. Titebond III Ultimate and Titebond II Premium Wood Glues have even been approved for indirect food contact. We do recommend wearing gloves when working with Titebond Polyurethane Glue; not only will it stain your skin, but repeated use of the product without gloves increases your exposure. This could cause irritation or lead to a sensitivity to those types of products.

### How Do I Clean Up Wet Glue Or Remove Dried Glue?

For most of our wood glues, it is often best to use a damp cloth and remove excess glue before it has dried. After the glue has dried, scraping or sanding works well. When wet, Titebond Polyurethane Glue may be removed with acetone, but it is much easier to chip off the foam after the glue has cured.

### Is It Possible To Dye Titebond Wood Glues A Different Color?

Yes. It is possible to change the color of most Titebond Wood Glues by adding aniline-based dyes. Call Technical Service at 1-800-347-4583 for more information.

### Can Titebond Wood Glues Be Used After They Have Been Frozen?

Yes. While freezing is not recommended, extensive testing indicates that the glues can be frozen and thawed up to five times without compromising performance. If your glue has been frozen, let it acclimate to room temperature and shake/stir to original form.

### What Is The Shelf Life Of Titebond Wood Glues?

Please refer to chart below. Although some of our glues last well beyond two years, the freshest material provides the best results. If the glue has thickened, shake/stir to original form. To determine the age of the glue, check the lot number located on the bottle.

### How Do I Read The Lot Numbers?

Our current lot numbering system is a 10 digit code. The format is: aymmddbat#. The "a" stands for Made in the U.S.A. The "y" is the last digit of the year of manufacture. Digits "mm" represent the month, and "dd" represent the day of the month. The final four digits represent the batch number used for quality control purposes. Therefore, a product with the lot number A104270023 was manufactured on April 27, 2011.

### What Happens If The Glue Tip Becomes Clogged?

Remove the cap from the glue bottle and pull up on the transparent tip until it snaps off. Clean both the colored cap and the transparent tip using warm water. Once cleaned, snap the transparent tip back onto the colored base and screw the cap back onto the glue bottle.

### Can Titebond Wood Glues Be Thinned?

Yes. Most of our wood glues can be thinned with water up to 5% by weight or volume. Adding more than 5% water to our glues could negatively affect the bond strength. Titebond Polyurethane and Titebond Liquid Hide Glues can be thinned by carefully heating the bottle in a pan of warm water.

### How Do I Obtain A Material Safety Data Sheet?

Visit [www.titebond.com](http://www.titebond.com) or call Technical Service at 1-800-347-4583.

PRODUCTS	TYPE	STRENGTH +	CHALK TEMP	SHELF LIFE	DRIED FILM	CLEANUP	VOC	OPEN/CLOSED ASSEMBLY TIME
Titebond III Ultimate	Proprietary Polymer	4,000 psi	47°F	2 years	Light Brown	\$	5.6 g/L	10/15 minutes
Titebond II Premium	Cross-linking PVA	3,750 psi	55°F	2 years	Yellow	\$	5.5 g/L	5/10 minutes
Titebond Original	Aliphatic Resin	3,650 psi	50°F	2 years	Yellow	\$	10.7 g/L	5/10 minutes
Titebond II Dark	Cross-linking PVA	3,750 psi	55°F	2 years	Brown	\$	5.5 g/L	5/10 minutes
Titebond Polyurethane	Polyurethane	3,510 psi	n/a	1 year	Tan	#	0 g/L	25 minutes total
Titebond Translucent	PVA	3,550 psi	50°F	2 years	Translucent	\$	10.7 g/L	5/10 minutes
Titebond No-Run, No-Drip	Thixotropic PVA	3,000 psi	55°F	2 years	Clear	\$	9.8 g/L	5/10 minutes
Titebond Liquid Hide	Natural Protein Emulsion	3,590 psi	n/a	1 year	Transparent Amber	@	0 g/L	10/20 minutes

+ Maple to Maple (ASTM D-905) Bond Strength at 70°F    \$ Water when wet, sand when dry.    @ Water when wet or dry.    # Mineral spirits when wet, sand or scrape when dry.



## Titebond® Original Wood Glue

The industry standard for general woodworking, this original aliphatic-resin glue has been the professional's choice for over 50 years. It provides strong initial tack and fast speed of set to reduce clamp time. Titebond Original Wood Glue develops bonds stronger than the wood itself, offers excellent sandability and is unaffected by finishes. It provides superior resistance to heat, solvents and mildew, and is ideal for hardwoods, softwoods and most other porous materials. It is easy to use, non-toxic, solvent free and cleans up with water.



## Titebond® Translucent Wood Glue

Designed for general household, craft and woodworking projects, it provides a virtually invisible glue line and bonds stronger than the wood itself. A strong tack and fast speed of set helps reduce clamp time. When dry, this wood glue is unaffected by finishes and sands easily. Titebond Translucent Wood Glue is easy to use, non-toxic and cleans up with water. It is specifically designed for wood, particleboard, and most other porous materials.



## Titebond® No-Run, No-Drip Wood Glue

The thickest, fastest-drying glue available for use with porous and semi-porous materials. This glue dries clear and is ideal for end grain gluing of finish and trim carpentry, including crown moldings, chair rails, baseboards, window casings and other applications requiring a professional-strength, no-run wood glue. Titebond No-Run, No-Drip Wood Glue provides strong initial tack and fast speed of set, yet allows realignment of working pieces to ensure proper positioning. It develops a bond stronger than the wood itself, offers excellent sandability and is unaffected by finishes. It is solvent-free, non-toxic and cleans up with water.



## Titebond® Liquid Hide Wood Glue

The first hide glue to be offered in a liquid, ready-to-use form - requires no heating or mixing. Professional woodworkers utilize this formula for its exceptional strength, long open assembly time and superior creep-resistance. Craft hobbyists use Titebond Liquid Hide as a "crackling" medium to achieve a weathered look on furniture, cabinets, picture frames and more. Its sensitivity to moisture allows for the easy disassembly of parts, a critical benefit in antique restoration and the repair of musical instruments.