Lesson 12: Gluing and Clamping

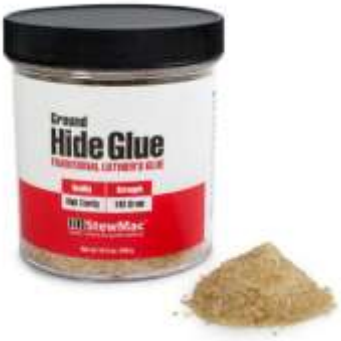
Introduction

In **Woodworking,** these are essential processes that ensure parts of a project are securely joined together. A strong adhesive and the right damping method can make a joint as strong- or even stronger- than the wood itself. This lesson discusses the types of glues and gluing techniques as well as the different types of clamps commonly used in woodworking.

Types of Glues and Gluing Techniques

- **PVA Glue (Polyvinyl Acetate)**

  The most common wood glue, also called white glue or carpenter's glue. It dries clear, is easy to use, and works well for general woodworking.



- **Hide Glue**

  A traditional glue made from animal products, often used in fine woodworking and instrument making. It allows easy disassembly for repairs.

- **Epoxy**

  A two- part adhesive (resin and hardener) that creates a very strong and waterproof bond. Best for outdoor furniture or structural repairs.

- **Polyurethane Glue**

  Expands as it dries, making it useful for filling small gaps. It is also water resistant.

- **Cyanoacrylate (CA) glue**

  Known as “super glue” used for small repairs, quick fixes, and inlay work.

Gluing Techniques

In woodworking, it is important to know the proper way of administering the glue on to the workpiece, this is to ensure that no material is wasted and the process itself is properly done and observed

- Surfaces must be dean, dry, and well-fitted.
- Apply glue evenly on both mating surfaces.
- Use clamp to maintain pressure while glue dries.
- Wipe off excess glue immediately to avoid stains.

TYPES of CLAMPS

1. C-Clamps

Shaped like the letter “C”, These damps are adjustable and versatile. They are used for small to medium projects, such as holding boards while gluing. C-clamps consist of a C-shaped frame with a fixed jaw and a single-threaded screw for tightening against flat surfaces.

2. Extended Throat C-Clamp

An extended throat C-clamp is a C-clamp with extra-long jaws, which allows it to apply clamping pressure furthered toward the center of a workpiece.

3. Clutch Clamp

Similar in design to the F-clamp, a clutch clamp utilizes a clutch to lock the jaws in place. Engaging the clutch with your thumb releases the jaw's hold on the bar, which allows you to loosen the clamp with one hand. The weakness of both F-clamps and clutch clamps is the tendency for the straight bar to bow as pressure is applied, which can compromise precision wood joinery.

4. Parallel Clamp

As an answer to the bowing issue found in F-clamps and clutch clamps, parallel clamps feature a strong bar with two parallel clamping surfaces that create full contact with the workpiece. The two clamping surfaces are designed to stay parallel with one another as pressure is applied, which aids in maintaining straight glue-ups.

5. Pipe Clamp

A pipe clamp consists of two clamp ends mounted on a custom-cut section of galvanized or black steel pipe. One end screw to the threaded end, while the other slides along the pipe and locks into place. The design of a pipe clamp gives it similar advantages in joinery to the parallel clamp, with the added ability to customize the length of the clamp by utilizing a larger pipe section. Additionally, pipe clamps are much easier on the wallet.

6. Spring Hand Clamp

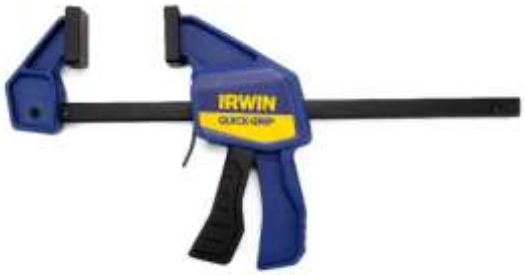
Spring hand clamps are clamps that apply pressure with a spring located at the hinge point, much like a chip clip. These handy clamps come in all shapes and sizes, as well as a variety of materials for different uses and strengths.

7. Ratcheting Hand Clamp

Ratcheting hand clamps are similar to spring hand clamps, but instead of a spring, a ratcheting mechanism is used to apply pressure incrementally.

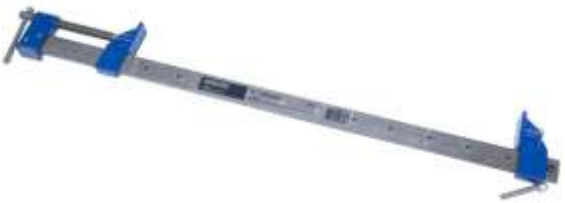
8. Speed Clamps (Quick-Grip Clamps)

Easy to use with one hand, speed clamps are great for quick adjustments and light clamping needs. They are convenient for holding workpieces temporarily.



9. Sash Clamps

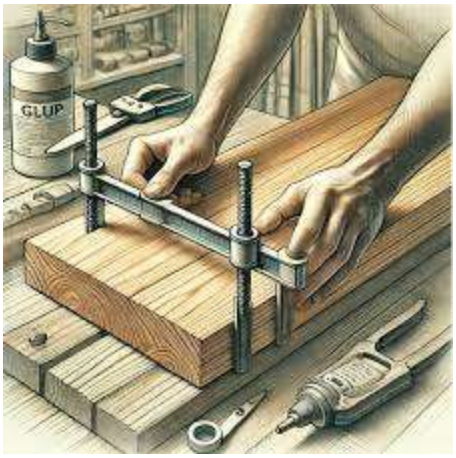
Long, heavy-duty clamps designed for large panels, doors, or tabletops. They provide strong, even pressure across wide surfaces.



10. F-Clamp

Like the C-clamp, the F-clamp is named for its resemblance to a letter. Rather than being held by a fixed, C-shaped frame, the threaded screw is held by a sliding member that rides along a straight portion in the frame. This allows the jaws to expand and hold much more material than a C-clamp is capable of. F-clamps often have large throats, which allow them to clamp further toward the center of larger materials.

Safety Practices in Gluing and Clamping



Always wear gloves when using strong adhesives such as epoxy or polyurethane. Avoid inhaling fumes from glues—work in a well-ventilated area. Do not overtighten clamps, as this can damage wood or squeeze out too much glue. Check clamps regularly for wear and proper function.

Terminologies

- **Adhesive** – A substance used to stick materials together, such as wood glue.
- **PVA Glue** – Polyvinyl acetate glue, the most common carpenter's glue used in woodworking.
- **Hide Glue** – A traditional glue made from animal products, used in fine woodworking and musical instruments.
- **Epoxy** – A two-part adhesive (resin + hardener) that forms a strong, waterproof bond.
- **Polyurethane Glue** – A type of glue that expands as it cures, filling gaps and providing water resistance.

- **CA Glue (Cyanoacrylate**) – Also called "super glue," it sets very quickly and is used for small repairs.
- **Clamp** – A tool used to hold pieces of wood firmly together while glue dries or during assembly.
- **C-Clamp** – A clamp shaped like the letter "C," commonly used for small woodworking projects.
- **Band Clamp (Strap Clamp)** – A flexible clamp that wraps around irregular or curved objects to apply even pressure.
- **Ratchet Strap Clamp** – A band clamp with a ratcheting mechanism for tightening.
- **Speed Clamp (Quick-Grip Clamp)** – A clamp that can be tightened quickly with one hand, useful for fast adjustments.
- **F-Clamp** – A clamp shaped like the letter "F," suitable for holding larger workpieces.
- **Sash Clamp** – A long, heavy-duty clamp used for wide panels, doors, or tabletops.
- **Glue Line** – The thin layer of glue between two bonded surfaces.
- **Clamping Pressure** – The force applied by a clamp to ensure a secure glue bond.
- **Cure Time** – The amount of time required for glue to fully harden and reach maximum strength.
- **Excess Glue** (**Glue Squeeze-Out**) – Extra glue that seeps out of the joint when pressure is applied.
- **Ventilation** – Airflow in the working area to reduce exposure to glue fumes.

Reference

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