

Lesson 14: Finishing Techniques

Introduction

Most types of wood will easily pick up scratches, dings, and dirt, and oil and liquids will always leave marks. Wood can also shrink or expand in response to the moisture in the air. Finishes, to varying degrees, protect the wood from all of the above, either with a protective layer over the top or by penetrating the surface and hardening there. Additionally, most finishes will accentuate the grain, and when a number of coats are built up make it really shine.

Penetrating finishes are oil-based and absorbed by the wood. They are easier to apply than surface finishes and give the wood a more natural look.

Finishing is the final stage in woodworking that enhances the beauty of the project and protects the wood. Proper finishing techniques ensure smooth surfaces, durability, and professional-quality results. This lesson covers surface preparation, repairing imperfections, and the use of scrapers and sanding tools.

Wood Finishing Techniques

Hand-Sand the Curves

Sand curved surfaces—and other areas an electric sander can't reach—by hand. Treat all areas equally, using the same progression of sandpaper grits for both hand and power sanding. Start with 80-grit to sand away blemishes, then use 120-grit and finally 180-grit. Using these exact grits isn't vital (100-150-180 works too), but it's important to progress in steps, removing deeper scratches and leaving finer scratches each time.



Hand Sanding tips:

- Description: Involves using sandpaper wrapped around a block or directly by hand.
- Best For: Edges, corners, and detailed areas where power sanders cannot reach.
- Steps:
 1. Start with coarse grit (60–80) for rough areas.
 2. Move to medium grit (120–150) for general smoothing.

3. Finish with fine grit (220 or above) for polishing.
- Advantages: More control, precise work, and less risk of over-sanding.
 - Limitations: Time-consuming and tiring on large surfaces.

Sand Without Scratches

A random orbital sander leaves scratches that are practically invisible, so you can sand across joints where grain changes direction. But move slowly (about 1 inch per second) and apply light pressure. Otherwise, you'll get swirly scratches.



Random Orbital Sander

- Description: A power sander that moves the sanding pad in a random orbit to avoid creating swirl marks.
- Best For: Large flat surfaces, quick and even sanding.
- Features: Variable speed, dust collection, and different pad sizes.
- Steps:
 1. Attach the correct grit sanding disc.
 2. Hold flat on the surface, applying light pressure.
 3. Move slowly with overlapping strokes.
- Advantages: Fast, efficient, produces a smooth finish.
- Limitations: Needs electricity, requires practice to avoid gouges.
- Why Sanding Matters: Sanding is critical to achieving a smooth, even surface that accepts finishes uniformly and highlights the natural grain of the wood.

Sand With the Grain

Sand with the grain when hand sanding or using a belt sander. Scratches are hard to see when they run parallel to the grain. But even the lightest scratches across the grain are obvious, especially after staining



Scrape Paint Faster

Steel scrapers work great—for the first few minutes. Then they need to be sharpened or replaced. But a carbide scraper blade will stay plenty sharp for a long time, even when you're removing thick paint buildup.

In addition to a reversible carbide blade, this heavy-duty scraper has a knob on top for two-handed operation—a must for tough scraping jobs. You can even flip the scraper over and use the knob as a hammer to set protruding siding nails. If you've ever scraped paint from an old house, you know how handy that is.



Scrapers are thin, flat pieces of steel with a sharpened edge used to smooth wood surfaces. They are especially useful in areas where sandpaper is less effective.

- **Functions of Scrapers:**

1. Remove thin shavings of wood without gouging.
2. Clean dried glue lines.
3. Smooth uneven surfaces and small ridges.
4. Prepare wood before fine sanding.

- **Advantages of Scrapers:**

1. Provide a smoother finish than coarse sanding.
2. Do not leave scratches if used properly.
3. More efficient at removing glue or old finish than sandpaper.

- **Why It Matters:** Scrapers allow woodworkers to achieve a clean, professional surface with less sanding effort.

Types of Scrapers

There are following types of scraper tools are used, and their uses are described below in detail.

- Flat Scraper
- Half Round Scraper
- Three Square Scraper
- Bullnose Scraper
- Two Handle Scraper
- Hook Scraper

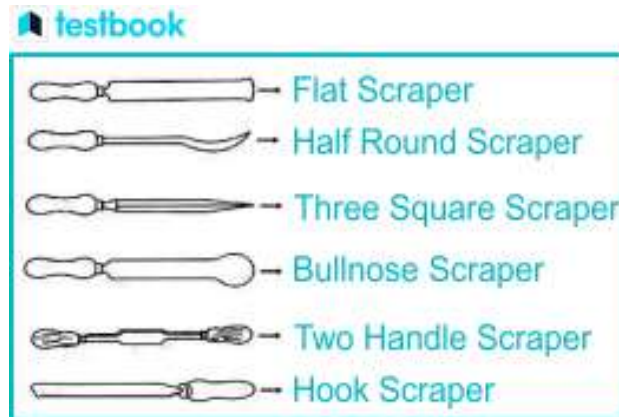


Fig 1: Types of Scrapers

- **A flat scraper** is specifically designed for precision work on flat surfaces. Its cutting edge is rounded, forming a convex shape, and it comes in varying lengths ranging from 100 mm to 300 mm. The edge of a flat scraper is ground on one side at an angle of 81° , enabling it to remove material from flat surfaces with accuracy adeptly.
- **Half-Round Scraper:** Also known as a bearing scraper due to its application in surfacing bearings, the half-round scraper features a semicircular shape. Its design allows for effective work on curved surfaces, and it plays a crucial role in ensuring the smooth functioning of bearings within machinery and mechanical systems.
- **Three-Square Scraper:** The three-square scraper derives its name from its triangular shape, which includes three cutting edges. This tool is especially valuable for sharpening the edges of bush bearings and for the precise scraping of inner spherical surfaces. Its versatility makes it an essential addition to a metalworker's toolkit.
- **Bullnose Scraper:** Resembling the nostrils of a bull, the bullnose scraper is aptly named. This scraper is well-suited for tasks involving flat and half-round surfaces. Its edge is configured in a circular disc shape, covering about $\frac{2}{3}$ of the circle's circumference. Bullnose scrapers excel in handling large bearing surfaces, and they are used for both longitudinal and circumferential scraping to ensure the integrity of these critical components.
- **Two-Handle Scraper:** Two-handle scrapers are versatile tools that serve two main purposes: scraping large flat surfaces and working on substantial curved surfaces. With their double-handled design, these scrapers offer improved control and stability, making them valuable assets in tasks that require precision and uniformity.

- **Hook Scraper:** The hook scraper, while sharing some similarities with the flat scraper, distinguishes itself with its pointed tip bent at a 90° angle. This unique design allows it to access areas that may be challenging for flat scrapers. Hook scrapers are particularly handy for finishing work and for scraping the central portions of larger flat surfaces, ensuring a smooth and even finish.

Scraping Techniques

Before embarking on any scraping operation, it is imperative to prepare the workpiece's surface adequately. This involves thorough cleaning and the application of a pigment or marking media. These pigments, which include Prussian Blue, Lamp Black, and Red Lead mixed with oil, serve as essential aids in detecting irregularities and achieving precise scraping results. Proper technique and the right scraper for the job are crucial to achieving the desired surface finish and component accuracy.



Repair a Hole in a Wood Surface

Refresh your house with a fresh coat of paint. Make sure to repair any holes in your wood surfaces first.

For Best Results:

Refer to our how-to for step-by-step techniques.

Suggested Tools & Supplies

- Ladder
- Patching Material
- Protective Apparel
- Putty Knife
- Rags
- Sandpaper (100, 220 Grit)
- Vinyl Gloves

Step 1

Using 100-grit sandpaper, lightly sand any raised or rough edges around the hole. Remove any dust or debris from the area with a lightly water-dampened rag.



Step 2

Using a putty knife, spread a thin layer of patching material into the hole. Allow it to dry.

TIP: To create an even surface, always smooth out (feather) the patching material 1"-2" beyond the repaired area.

Step 3

Use 220-grit sandpaper to smooth the patched area and make it even with the surface.

TIP: If shrinking of the patching material occurs, lightly sand and clean the area and apply additional layers of patching material as needed.



Step 4

Remove any final dust or debris from the finished repair.

Repair a Gap

Take the time to repair any gaps in your home's exterior.

For Best Results:

Our how-to will give you detailed, step-by-step directions on how to repair any gaps in your home's exterior.

Suggested Tools & Supplies

- Caulking (Painter's Grade)
- Caulking Gun
- Vinyl Gloves
- Ladder
- Protective Apparel
- Putty Knife
- Rags
- Sandpaper (100 Grit)
- Scraper

Step 1

Using 100-grit sandpaper, lightly sand any raised or rough areas.

TIP: Use a scraper to remove any old caulking or debris from the gap or seam.



Step 2

Using a caulking gun, apply a thin layer of painter's grade caulking to the gap or seam.

Step 3

Immediately following the repair, wipe off any excess caulking with a damp rag or putty knife.



Step 4

Allow the area to dry.

TIP: Reapply caulking where shrinking has occurred.

Ways to Fill Large Holes in Wood

When working with old wood, it's often necessary to repair damage such as large holes resulting from rot or poor craftsmanship. Whether you're diving into a detailed tutorial on advanced woodworking or simply tackling the never-ending home improvement list, understanding wood filling is essential. Here are nine commonly used methods to help any DIY-er fill voids and large holes in various types of wood.

Wood Putty

Understanding the wood grain and types of wood you're working with can influence your choice of wood filling methods. Wood putty is a compound designed for repairing holes in wood. It's available both pre-made and as a powder that you mix with water. Its color closely resembles wood, making it ideal for blending in holes when the wood grain remains visible, like on wooden furniture.

How to Use Wood Putty:

1. Clean the hole of debris. For deep holes, deepen them slightly using a chisel to ensure the putty fills them entirely.
2. Follow the package instructions to mix the wood putty. If it's in powder form, add water until achieving a thick paste consistency.
3. Use a putty knife to fill the hole, applying light pressure in a back-and-forth motion.
4. Smooth the putty's surface with the knife, removing any excess.
5. Allow the putty to dry, typically around 24 hours.

6. Sand the dried putty with fine-grit sandpaper or an electric sander until smooth. Finish with stain or other products as necessary.

Wood Glue with Toothpicks

For those who prefer a quick tutorial on using common household items for wood filling, wood glue combined with toothpicks can be an effective solution.

How to use Wood Glue and Toothpicks:

1. Clean the hole, removing debris or loose wood.
2. Drip wood glue into the hole until nearly full.
3. Insert toothpicks until the hole is filled.
4. Allow the glue to dry, ranging from an hour to 24 hours.
5. Sand the dried area until it's flush with the surrounding wood.

Wax Candle

In a pinch, a candle can be substituted as a wood filler. This method is especially useful when trying to match the wood grain of antique pieces.

1. Trim the candle wick to about 1/4 inch for precision.
2. Melt the candle's end slightly.
3. Drip the wax into the hole, allowing each layer to cool before adding more.
4. Buff and sand the surface, then stain as desired.

Wood Plugs + Wood Dowels

For a tutorial on advanced wood-filling techniques, using wood plugs or dowels can be a great start. These small pieces of wood are designed to fill holes in other wood pieces, making them ideal for various types of wood.

To use a wood plug:

1. Determine the hole's size to select the appropriate plug.
2. Cut a square or rectangle around the hole using a chisel or knife.
3. Ensure the plug's depth is slightly less than the hole's. Adjust as necessary.
4. Hammer the plug into the hole. If using a screw, drill a hole in the plug's center.
5. Optionally, apply wood glue before inserting the plug.
6. Finish your project, painting or staining over the plugs.

Sawdust/Glue

For DIY-ers looking for a simple solution to make homemade wood fillers, combining sawdust and wood glue can be a simple and effective method.

1. Collect fine sawdust from the wood you're working on. You can get this from sanding the wood or from a saw.

2. Mix the sawdust with a clear or wood-colored carpenter's glue in a small container until you achieve a thick, putty-like consistency
3. Press the mixture into the hole using a putty knife or your finger.
4. Overfill the hole slightly to account for shrinkage as the filler dries.
5. Allow the mixture to dry thoroughly. This can take several hours to a day, depending on the size of the hole and the amount of filler used.
6. Sand the dried filler flush with the wood surface.
7. Finish with paint, stain, or sealant as desired.

Bondo Polyester Resin Wood Filler

Polyester resin is a type of thermosetting plastic that can be used as a wood filler. It's often used in marine applications because of its water-resistant properties. When combined with a hardener, it forms a solid, durable fill that can be sanded, painted, or stained and is considered one of the best wood fillers on the market.

How to Use Wood Filler:

1. Preparation: Clean the hole or damaged area to ensure it's free from dust, debris, and loose wood particles.
2. Mixing: In a disposable container, mix the polyester resin with the hardener according to the manufacturer's instructions. It's essential to get the proportions right for the resin to cure correctly.
3. Filling: Using a putty knife or spatula, apply the mixed resin into the hole. Ensure you press the mixture into the hole to avoid any air pockets. Overfill slightly to account for any shrinkage upon drying.
4. Drying: Allow the resin to cure as per the manufacturer's recommended time. This can vary but usually takes several hours.
5. Finishing: Once the resin has fully cured, sand the area until it's flush with the surrounding wood. You can then paint, stain, or varnish over the filled area to match the rest of the wood.

Caulk

Caulk, especially paintable acrylic or latex caulk, can be used to fill small to medium-sized holes in wood, especially in trim or areas that won't be subjected to heavy wear.

How to Use Caulk to Fill Wood Holes:

1. Preparation: Clean the hole or damaged area to ensure it's free from dust, debris, and loose wood particles.
2. Application: Cut the tip of the caulk tube at an angle. Using a caulk gun, squeeze the caulk into the hole. Make sure to press the caulk into the hole to avoid air pockets. Overfill slightly as caulk can shrink as it dries.
3. Smoothing: Wet your finger or a caulk smoothing tool and smooth out the caulk to make it flush with the wood surface.

4. **Drying:** Allow the caulk to dry thoroughly. This can vary depending on the type and brand of caulk but usually takes several hours to a day.
5. **Finishing:** Once dried, the caulk can be sanded lightly if needed. If the caulk is paintable, you can paint over it to match the rest of the wood.

Caulk is flexible, making it a good choice for areas that might experience some movement or temperature fluctuations. We recommend a water-based paintable acrylic or latex caulk.

Additional Tips on How to Fill Holes In Wood

- Work on a flat surface for even application.
- If possible, work in a climate-controlled space to ensure proper drying.
- Allow ample drying time, especially for larger holes.
- Sometimes, wood is too rotted to repair. Consider replacing it.
- Properly prepare your workspace, ensuring cleanliness and having all necessary materials on hand.
- For larger holes, ensure you have enough filler material. Two-part epoxy kits are ideal.
- For smaller holes, wood glue, paste, or putty is sufficient. Use wood plugs for precision repairs on delicate items.
- After repairs, additional paint or stain coats may be necessary for a seamless finish.
- Always let the filler dry completely before painting or using the wood.

No matter which method you choose to use, make sure to let the material dry completely before you start painting or using the wood again. Otherwise, the paint or finish may not adhere properly.

Terminology

1. **Surface Preparation** – The process of cleaning and smoothing wood before finishing.
2. **Wood Filler** – A substance used to fill cracks, dents, or holes in wood.
3. **Putty Knife** – A flat tool used to spread and smooth filler.
4. **Dowels** – Small wooden cylinders used to repair or reinforce holes.
5. **Scraper** – A tool for shaving thin layers of wood to smooth surfaces.
6. **Grain Direction** – The natural alignment of wood fibers, important when sanding or scraping.

7. **Sandpaper Grit** – A measure of coarseness or fineness of sandpaper.
 8. **Hand Sanding** – Manual process of smoothing wood using sandpaper.
 9. **Random Orbital Sander** – A power tool for sanding surfaces without leaving swirl marks.
 10. **Swirl Marks** – Circular scratches caused by improper sanding.
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Reference

Handyman, F. (2023, June 16). Wood finishing tips. *Family Handyman*.

https://www.familyhandyman.com/list/wood-finishing-tips/?srsId=AfmBOoqM7epZGtBhaHQQAWClkdZ_VNy7DM5aYhMF9o4gPbQWWNH4oS_6

Types of scrapers: Learn with definition, diagram, and uses. (n.d.). Testbook.

<https://testbook.com/mechanical-engineering/types-of-scrapers>

How-to repair a hole on exterior wood surface | Behr. (n.d.).

<https://www.behr.com/consumer/how-to/exterior/how-to-repair-a-hole-on-a-wood-surface>

Repairing holes in wood | *Guide to sealing knotholes.* (n.d.).

<https://www.festoolusa.com/knowledge/application-examples/repairing-holes-in-wood>