

Finishes and Finishing Techniques

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Review pages 147-150, 284-294

Finishes and finishing techniques

- The finishing process to choose depends partly on the
 - **type of wood** and
 - the **appearance wanted** for the piece.
- You need to consider
 - what **finishing facilities** and
 - **equipment** are available.

Removing the defects and glue

- **Remove glue by scraping** not sanding
 - Sanding forces glue into the wood causing an imperfection.
- **Repair dents** with a damp cloth and a hot iron.
- **Clean and fill** cracks etc.
 - Wood putty
 - Cellulose
 - Shellac sticks
 - Wax sticks

Removing the defects and glue

Abrasive Paper (sandpaper)

- Sandpaper works a lot like a saw, chisel, or any other cutting tool in your lab.
- The **particles on sandpaper** are made up from a number of sharp edges that cut the wood the same way a saw blade does.
- The only real difference is that sandpaper, unlike your saw, can't be sharpened.
- If you have a lot of sanding to do, always start with the large grit paper first, then move to the smallest (finer) grits.
- Once finished sanding, always thoroughly remove the dust from your project - use a vacuum and tack cloth.

Removing the defects and glue

Abrasive Paper (sandpaper)

- There are **two different grades of sandpaper** on the market;
 - **Commercial** and
 - **Industrial**.
- The **commercial grade** is commonly available at hardware stores and home project centers.
- The **industrial grade** is usually available only through industrial supply stores.
 - It's made from higher quality materials and is designed to be used in the rigors of the production line.

Removing the defects and glue

So what's the difference between Commercial and Industrial grades?

- There are **three main components** to sandpaper;
 - the **abrasive grit**,
 - the **backing material**, and
 - the **bonding agents**.
- **Industrial grade** sandpaper uses **higher quality** components as well as **tighter manufacturing tolerances**.

Removing the defects and glue

So what's the difference between Commercial and Industrial grades?

Abrasive Grit

- Industrial grade sandpapers use abrasive grit material that is stronger and less likely to break down or wear out. Higher quality grits are often very finely graded to ensure consistency.

Backing Material

- Commercial grade sandpapers tend to use kraft paper or low-grade fabric as a backing material. Higher grades of backing material are often made from fine cottons or polyesters.

Bonding Agent

- The bonding agent is the glue that attaches the abrasive to the paper's backing. Lower grades of sandpaper are often made from hide glue, which doesn't hold up well with heat or moisture. Higher-grade bonding agents such as phenolic resin are used for industrial grade sandpapers.

Removing the defects and glue

What's the difference between "Open-coat" and "Closed-coat" sandpaper?

- Open-coat sandpaper has gaps and open spaces between the grits that helps prevent clogging by giving the sawdust a place to go.
- Open-coat is most often used for woodworking. The spaces in the sandpaper can cover 40-60% of the sandpaper's surface.
- Closed-coat is better for sanding metal and wood finishes but clogs easily with sawdust.

Removing the defects and glue

What is grit?

- When talking about sandpaper, "grit" is a reference to the number of abrasive particles per inch of sandpaper.
- The lower the grit the rougher the sandpaper and conversely, the higher the grit number the smoother the sandpaper.
- This make sense if you imagine how small the particles on an 800-grit sandpaper would need to be to fit into a 1" square.
- Sandpaper is referred to by the size of its grit (i.e. 150-grit sandpaper).

Removing the defects and glue



Removing the defects and glue

- ...with extra coarse grit abrasive (36 - 40)
 - Heavy material removal on extremely thick surfaces.
- ...with coarse grit abrasive (50 - 60)
 - Heavy material removal on extremely thick surfaces, rough sanding or paint stripping.
 - Removes: machine marks, glue marks, pen/pencil marks and burn marks.
- ...with medium grit abrasive (80-100)
 - Medium material removal and pre-paint finishing
 - Removes: scratches from the coarse grit.

Removing the defects and glue

- ...with fine grit abrasive (120-150)
 - Light material removal and pre-paint finishing.
- ...with very fine grit abrasive (180-220)
 - Finish sanding and sanding between coats.
- ...with extra fine grit abrasive (280-320)
 - Sanding between finish coats.
- ...with super fine grit abrasive (360-600)
 - Final surface sanding between, extra smooth finish.

Removing the defects and glue

Backing Material

- "A" - lightweight paper, very fine grit, hand sanding, flexible.
- "B" - lightweight paper, hand sanding
- "C and "D" - medium weight, for sheets and discs or random orbit sanders
- "E" and "F" - heavyweight, discs and belts
- "J" - cotton cloth, designed for flexibility
- "X" - cotton cloth, heavy-duty sanding belts
- "Combination" - reinforced heavyweight paper, discs and drums used in floor sanding.

Removing the defects and glue

- **Glass paper**
 - Pale yellow, wears quickly, not suitable for fine woodwork
- **Garnet paper**
 - Reddish brown, good-quality paper
- **Aluminum-oxide paper**
 - most common woodworking abrasives
 - ...when heat and pressure are applied it fragments.
 - ...this is highly desirable because when Aluminum Oxide fragments it creates new sharp edges.
 - This self-renewing property allows Aluminum Oxide to last longer than most other sandpapers.
 - Brown, dark red for belts used on power tools

Removing the defects and glue

- **Silicon-carbide paper (wet/dry paper)**
 - ...is harder than both Aluminum Oxide and Garnet.
 - This makes it suitable for cutting harder materials such as metal, paint, plastic, and fiberglass.
 - Silicon carbide is also a friable abrasive but when wood is not hard enough of a material to fracture its surface.... it will tend to wear out faster than Aluminum Oxide.
 - Gray - Dark gray to black, usually used between topcoats
- **Ceramic** is not a friable material.
 - It is the hardest of all of the abrasives commonly available.
 - It is generally available in only the roughest grades for fast wood removal in woodworking.
 - The most common use for ceramic sandpaper is shaping and leveling of wood.
 - It is also one of the most expensive materials available.
 - You are most likely to see ceramic abrasives used on belt sander belts.

Wood Fillers

- **Wood Fillers** - applied to open grain
 - Used to produce a smoother surface
 - Enhance the beauty of the wood
 - Highlighting the grain
 - Paste, semi-paste or liquid form
 - Contains
 - Powered quartz, linseed oil, turpentine, drying agents
 - Natural color is tan but can be changed
 - Varnish and lacquer are used as clear fillers

Wood Fillers... continued

- Before filler, **clean** with shellac or lacquer
- Applied with brush
 - First with the grain then against
 - While wet - wipe with grain
 - After dried, ready for staining, finishing or painting.

Staining

Staining: provides a solution that is used to give a rich undertone and bring out the beauty of the grain.

- **Five reasons to use stain**
 - Bring out the grain of the wood
 - Bring surfaces uniform in color
 - Make different woods look alike
 - Make cheap wood look expensive
 - Create special effects

Staining

Applying a stain

- Brush
- Roll
- Wipe
- Dip
- Spray

See textbook for details

Staining

Four Basic types of Stains

- **Water**
 - used to create consistency in color. Disadvantage - will raise the grain of the wood. Most often it is sprayed on. Requires a pre conditioning and post sanding.
- **Oil**
 - Color is suspended in an oil base
 - **Pigment oil (wiping)** covers the grain but does not penetrate the wood. Available in gel form.
 - **Penetrating-oil stain (best used on softwoods)**
 - penetrates the wood surface
 - highlights the grain.
 - fade in sunlight.
 - longer on the wood the darker it will become.

Staining

Four Basic types of Stains.....

- **Non Grain Raising (NGR)**
 - Contains dye mixed with alcohol, methanol or spirit solvent used by furniture manufactures.
 - Applied by spraying.
 - The spirit base does not fade or bleed.
- **Spirit Stains**
 - ...has the fastest drying time of all stains.
 - most difficult to apply due to its drying time.
 - takes two coats to penetrate.
 - usually bleeds
 - used for touch-up or repair work.

Sanding Sealer

Lacquer or Shellac based sanding sealers.

- The sealer encapsulates the stain and permanently protects the finished surface.
- **Must be sanded with very fine grit sandpaper.**
- **Can be sprayed or brushed.**

Finishes

Finishes: provides a solution that is used to add beauty and gives protection to the wood.

- **Types of Finishes**
 - **Surface Finish**
 - **Varnish**
 - Slow drying and not very good at color retention.
 - **Lacquer**
 - Dries quickly.
 - **Synthetic**
 - Epoxy, polyurethanes and polyesters.
 - **Penetrating Oil**
 - Applied to give protection and adds beauty that penetrates the wood surface.
 - Tung oil - apply five to six coats, most durable oil finish.
 - Danish oil
 - **Waxes**
 - Liquid or paste

Finishes

Procedures for applying a complete basic finish.

- **Sand completely**
- **If open grain wood, use a paste wood filler**
 - Pre-wood conditioner- prevents blotches
- **If staining, apply the stain.**
- **Use sanding sealer, sand after completed with very fine sand paper.**
- **Apply two (2) coats of lacquer, varnish or a synthetic topcoat.**
 - **Between coats**
 - Sand with 600 grit.
 - Wipe with tack cloth to remove fine powder residue.

See the text for other special techniques.

Finishes

Waterborne Finishes - wooden floors

Healthy

- No toxic fumes and low Volatile Organic Compounds (VOCs) means your health isn't at risk. Waterborne finishes are healthier to work with, and there's no need to vacate the jobsite during refinishing.

Fast

- Fast dry times (1-3 hours) and cure times (80-90% in 3 days).

Durable

- Bona's advanced technology Swedish waterborne finishes are the most durable polyurethane finishes of any kind - waterborne or oil-modified.

Beautiful

Clear, high build finishes won't amber or change color over time, highlighting the true beauty and elegance of the wood.

Finishes

Waterborne Finishes - wooden floors - before



Finishes

Waterborne Finishes - wooden floors - after


