Finishing Solid Wood Products Workshop-
Finishing Materials for Green Finishes

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Staining Basics-Stains

- Stains Are Important to Create Interest to the Buyer
- Stains Change the Color of Wood to Something Else
- Stains Vary in Their Intensity
Staining Basics-Stains

• Stain Vary in How Much They Hide Grain

• Stains Can Make Wood More Beautiful

• Stains Help Mix Cheap Woods With Expensive Woods

Unfinished Wormy Maple-Do We Stain Lightly and Let Worms Show or Stain Darkly and Hide the Worms?
Staining Basics-Dye Stains Versus Pigments-

- Stains Are Colorants That Dye the Wood and Are Dissolved in a Liquid Solvent Carrier
- Dyes Penetrate the Wood & Are Transparent
- Pigments Are Finely Ground Earth or Synthetics and Hide the Grain to Some Degree
Staining Basics-Stains Versus Pigments-

- Pigments Lodge in Pores and Cracks and Are Wiped Off Smooth Grain = Highlighting the Grain
- Pigments Resist Fading While Dyes Fade Easier
- Dyes Use Faster Drying Solvents Than Pigment Wiping Stains
Pigments Versus Dyes

Figure 4-1: Pigment lodges in the pores, scratches, and defects in the wood, accentuating them. Dye saturates the wood fibers with color, usually producing a more even appearance. Source: Understanding Wood Finishing
Dye Stains Basics

• Water Soluble Dyes Dissolve in Water

• Alcohol Soluble Dyes Dissolve in Alcohol

• NGR Dyes Dissolve in Alcohols Like Methanol

• Oil Soluble Dyes Can Dissolve in Strong Petroleum Solvents But Some Can Dissolve in Vegetable Oils
Dye Stains Basics

• Water, Alcohol and Oil Soluble Dyes Can Be Purchased as Powders and Mixed With Solvents By the User

• Production Shops & Plants Use NGR Dyes Are Sold in Liquid Form Already Mixed-Drums and Buckets

• NGR Dye Stains Are the Most Used, Generally Sprayed to Wet the Surface, Then Dry Quickly

• Dye Stains Alone Tend Produce Uniform Looking Products
Example-
Minwax
Sample
Dye Stain
Chart

Lots of
Colors
Available
NGR Stains-Alcohol Based Stains

• NGR = Non Grain Raising

• NGRs Don’t Contain Water But Alcohols Like Methanol or Ethanol That Transmit Solvent Soluble Dyes

• NGR’s Are Acids in Nature, Mostly Made With Petroleum

• Sap Stains Are NGR’s Used on Light Color Sapwood
Aniline Dyes-Not Natural Sources

• Synthetic Transparent Colors Which Dissolve in the Solvent for Which They are Formulated (i.e., Water, Alcohol, or Oil). Some Dyes are Reducible in Multiple Solvents

• Some Woodworkers Use Strong Colors Often Different From the Browns Most Often Used by Industrial Finishers
Fillers

• Fillers Are Colored Pigments That Fill Up Open Pores of Woods Like Oak and Ash

• Use Fillers to Produce a Smooth Finish

• Fillers Are Thick and Take Labor and Time to Work Properly, Often Not Used on Lower Cost Products

• Fillers Need to Be Agitated to Prevent Settling
Pigment Wiping Stains

• In Factory Finishing Are Composed of Finely Ground Pigments in Slower Drying Solvents-Like Naptha and Mineral Spirits

• Flexible-Can Be Sprayed, Brushed or Dipped

• Wipe to Remove Excess and to Control the Look
Glazes

• Used Only on Higher Priced Wood Products

• Glazes Add Depth

• “Highlighting” Creates Contract-Light and Dark Streaks

• Highlight Using Steel Wool or Fine Sandpaper

• Adhesion is Important for Glazes to Sealer and Topcoats
Shade Stains

- Shade Stains Used on Edges
- Shade Stains Use NGR’s and Toner Stains
- Shade Stains Dry Fast
Pad Stains

• Used by Hand With a Rag

• Use Dye Stains Similar to NGR’s

• Often Very Important to Obtaining a High Quality Finish
Small Shop Vs. Factory Staining

• Small Shop Has More Time for Staining

• A Factory On a Cart System Running 20 Feet Per Minute With Carts 7’ Long on 8’ Centers Process 2.5 Carts Per Minute. Sprayers Only Have 24 Seconds to Spray Whatever is on a Cart!

• Production Line Finishes Have to Be Able to Dry Quickly Whether in Open Air or in Ovens
Topcoat Basics-Petroleum Finishes

• Top Coats Cover Color Stains and Offer a Clear Protective Layer of Coating

• Sealers-Seal the Stain and Provide a Good Base for Additional Layers of Clear Finish-a Clear Coat

• Sealers-Have Sanding Agents That Help to Make Hand Sanding Easy

• Sanding Smoothes the Surface
Washcoats-Petroleum Finishes

- Washcoats Are Thinned Sealers

- Used After NGR Stains and Before Wiping Stains

- Goal is to Keep the NGR Visible and Allow Open Pores to Grab Wiping Stains
Natural Topcoats-Shellac

• Shellac-Long History for Wood Products Finishing

• A Natural Resin Made by Insects

• Buy As Flakes and Mix With Alcohol or Pre-Mixed

• Colors-Amber or Clear

• Sheen-Buy as Gloss and Flatten With an Abrasive or Add Flattening Agents
Oil Finishes-Linseed Oil

• Linseed Oil-Oil From the Flax Seed

• Usual to Add Metallic Driers to Make Useable = Boiled Linseed Oil

• Low Level of Protection

• Danger of Fire When Using Rags
Oil Finishes-Linseed Oil

• Linseed Oil is a Thin Finish

• Does Not Stand Up to Heavy Use

• Easily Penetrated by Water
Oil Finishes-Tung Oil

• From the Nuts of Tung Trees of China, Was Once a Large Crop in Mississippi and Alabama

• A Water Resistant Natural Oil-Needs Multiple Coats

• Slow Drying Unless Polymerized-Cooked and Cross Linked

• Difficult To Use on Large Pieces If Polymerized-Dries Fast

• Rarely a Factory Finish
Oil Finishes-Tung Oil

- Most Retail Tung Oils Are Not Really Straight Tung Oils
- From Trees Native to China
- Once Widely Grown in MS, LA and AL
- Slow to Dry
- Lots of Confusion About Tung Oils, So One Should Use Lots of Hands On Trails to Figure Out What Tung Oil Products Work
Varnish-Petroleum Based

• Cook Oils With Resins

• Superior Drying Compared to Oils

• Lots of Confusion With Tung Oil & Varnish Finishes

• Rarely a Factory Finish
Painted Finishes

• Current Painted Finishes Include Antique Finishes Where One Paints a Hot Color Under a Top Coat Then Sand Away Edges

• Antique Painted Finishes Are Also Popular

• Normally Use a Primer to Gain Adhesion to Wood, Then Cover With a Top Coat

• Can Use Milk Based Paints for Green Finishes
Natural Waxes-Less Protective Than Linseed Oil-
Cannot Protect Against Water and Heat

• **Beeswax**-melts at 140 degrees

• **Carnauba Wax**-melts at 180 degrees, is a wax of the leaves of the palm, Copernicia prunifera, a plant native to and grown only in the northeastern Brazilian states of Piauí, Ceará, and Rio Grande do Norte.[1] It is known as "queen of waxes"[2] and usually comes in the form of hard yellow-brown flakes. It is obtained from the leaves of the carnauba palm by collecting them, beating them to loosen the wax, then refining and bleaching the wax. Often combined with beeswax improved properties

• Wax is good to keep the wood’s color constant