

# **Summary Report Commonly Available Consumer Finishes Applied to Western Juniper**

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## **Purpose**

The goal of this project was to demonstrate the ease of application and appearance of the wood of western juniper finished with readily-available consumer stains and varnishes<sup>1</sup>.

## **Methods and Materials**

The stains and top-finishes for this demonstration were chosen after questioning managers of home centers, hardware and paint stores, but the most popular and effective consumer-applied finishes. All indicated that consumers were looking for ease of application and cleanup in these products, with personal preference for color and, especially, type of top finish being quite variable. Spray and brush-on varnish coatings were equally popular as wipe-on oil finishes. Of the varnishes, the satin finish was slightly-more popular than either the gloss or flat. With these consumer preferences in mind, the following group of six interior varnishes were chosen as representative of the types normally purchased for finishing raw wood for interior uses:

- Deft aerosol spray gloss polyurethane
- Behr #603 aerosol spray gloss polyurethane (only used on unstained wood)
- Deft aerosol spray semi-gloss polyurethane
- Durathane brushed satin polyurethane
- Watco Danish Oil, wipe-on natural oil finish
- Formby's low gloss wipe-on tung oil

Popular stains were chosen to show the effect of coloring the wood, and to discover any inherent problems in their utilization with this species. The two pigmented stains chosen were:

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<sup>1</sup>Varnishes have been defined in the past as clear, oil-based coatings that were usually brush-applied. Today, a better definition would include spraying in this definition. Varnishes are generally differentiated from lacquer finishes by the fact that varnishes change chemically to be non-reactive with the original solvent, while lacquer finishes can be redissolved in their original solvent. For further information see "The Woodfinishing Book" by Michael Dresdner. ©1992 by The Taunton Press, Newtown, CT. ISBN 1-56158-037-6

Sherwin-Williams #A48 N 38 “fruitwood” oil-based, pigmented wiping stain  
 Watco Danish Oil “Walnut” oil-based, pigmented wiping stain.

The test panels were made from 0.375-inch thick by 4-6-inch pieces of “V”-edged western juniper paneling. Intergrown (red) knots and encased (black) knots as well as small bark inclusions and small areas of chipped and torn grain were found in the sample set. After planning and machining, the simulated “Do It Yourself” (DIY)-style paneling sections underwent a 3-stage random-orbit sanding process that finished with 220 grit paper. One side of each panel was left unstained, while the reverse was stained with one of the colorants.

Each display set was made up of 5 pieces, with each piece stained on one side and unstained on the reverse, and finished with one of the five top finishes or left unfinished. In addition, sample boards with 6-inch wide sections of each of the stain/varnish combinations were also prepared. Table 1 displays the combinations of coloring and finishing demonstrated in this project.

Table 1. Combinations of stains and varnishes used to demonstrate the finishing characteristics of the wood of western juniper.

Top Finish	Stain		
	Sherwin-Williams “Fruitwood”	Watco “Walnut”	Unstained
Deft Gloss Spray	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Behr Gloss Spray			<input checked="" type="checkbox"/>
Deft Semi Gloss Spray	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Deft Satin, Brushed	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Watco oil, rubbed	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>Formby’s tung, rubbed</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

After application of the stains (per manufacturers’ instructions) to the panels or areas scheduled to be colored, three coats of each of the chosen top coats were applied, also according to manufacturers’ instructions. After each coat of finish had been allowed to dry the prescribed time, the panels were lightly buffed with #00 steel wool between coats, with a final buffing with #0000 steel wool after the third, and final, coat had fully cured.

## Results

All combinations of finishes were suitable for use on western juniper. No distinct differences in ease of application were noted for any particular brand of the same type of finish. Oil finishing took longer to dry than the other top finishes, and would require the most rigorous pre-finishing preparation.

Stained panels appeared “blotchy” near larger round or spike knots due to the increased absorption of stain in these areas, a common occurrence in softwoods. Clear finishing with any

of the tested material reduced these color differences, with the satin or semi-gloss polyurethane being the most effective. Staining also tended to mask darker colored defects, such as the bark pockets, and the addition of varnish or oil finish enhanced this masking.

## **Future Work**

With the industry moving toward water-borne stains and varnishes, these systems should become more price-competitive with the solvent-based systems used in this demonstration. In the future, some products made from the wood of western juniper will be finished with water-borne materials, and evaluation of these materials should be conducted. In addition, tests of durability under different ultra-violet light and moisture regimens should be performed for both interior and exterior oil- and water-based finishing systems.