



# Advanced Housing Research Center

UAS Forest Products Laboratory  
Madison, Wisconsin

Tips and  
Techniques

## Wood Exposed Outdoors

Wood exposed outdoors can last for centuries. What kind of wood you choose and how you protect it makes a big difference in how long the wood lasts. Two conditions influence the service life of outdoor wood: weathering and decay.

### Weathering and Decay

Weathering is erosion from sun, wind and debris, and moisture. If wood is not protected by paint or stain, the weathering process removes about 1/4 inch of wood per century from softwoods on vertical exposures; even more wood is eroded in severe exposures.

The first step to prevent weathering is to block the sunlight. Finishes differ in their ability to protect wood from the sun. Paints can block sunlight completely, but they can trap moisture and encourage decay. Semitransparent stains are the next best way to block sunlight, followed by water-repellent preservatives, especially those that contain ultraviolet (UV) light inhibitors.

The other major service-life concern is decay (rot). Because outdoor wood is exposed to moisture, it is subject to decay. One way to reduce the likelihood of decay is to use treated wood. However, treated wood is often green or has other potentially undesirable properties, such as a tendency to warp.

The heartwood of some wood species is naturally “durable” or resistant to decay (Table 1).

Heartwood is the wood that extends from the pith (center of tree) to the sapwood (outer zone of tree, next to the bark).

There is general consensus that some second-growth timber, even from a decay-resistant species, is not as durable as the old-growth timber. The durability of any wood decreases as rain or other sources of moisture remove the natural preservatives. Wood kept dry will not decay, although it may still be vulnerable to attack by insects.

Although using a decay-resistant species or treated wood will reduce the incidence of decay, the wood can still weather, as well as crack and check, if not protected with a finish.

The penetrating finishes (stains and water-repellent preservatives) that are used on wooden decks can also be used for all wood discussed here. The best way to protect outside wood from weathering is to cover it with a roof. A roof also prevents decay as long as there is no other source of moisture, such as contact with the ground.

**Table 1. Decay-Resistant Species**

Baldcypress (old growth)
Catalpa
Cedar
Cherry (black)
Chestnut
Cypress (Arizona)
Juniper
Locust (black)
Mesquite
Mulberry (red)
Oak (bur, chestnut, Gambel, Oregon white, post, white)
Osage-orange
Redwood
Sassafras
Walnut (black)
Yew (Pacific)

### Outdoor Furniture

Outdoor furniture requires a durable finish that does not rub off on clothes. Paint can serve this purpose. Enamel paint provides a hard surface that wears well. Thin the paint for the first coat to increase penetration. Light sanding may increase adhesion of the topcoat. If possible, paint the end grain before furniture parts

re **Table 2. Comparison of Finishes for Various Uses**

Use	Latex	Enamel paint	Stain	Water-repellent preservative <sup>a</sup>
Furniture	Not good	Good	Adequate <sup>b</sup>	Adequate
Fencing	Very good	Adequate	Very good	Adequate
Play equipment	Not good	Adequate <sup>c</sup>	Good	Adequate
Artwork	Adequate	Adequate <sup>d</sup>	Very good	Adequate

<sup>a</sup>Provides little resistance to abrasion. <sup>b</sup>Tends to wear off outdoor furniture.

<sup>c</sup>Only with redwood or cedar. <sup>d</sup>Can be used for small pieces of artwork.

may  
not  
be

assembled.

lizer polyethylene glycol (PEG) is not appropriate for outdoor use because it washes out.

Cutting can be used to prevent or minimize drying stresses in poles. For example, totem poles are hollowed out from the back—the center is removed so that the remaining wood can shift during drying. Cutting a deep notch in the back of a pole will force most cracking to occur in one spot.

suitable if the equipment has been made from treated wood because such wood is prone to cracking. However, an enamel could be used if the wood is redwood or cedar. Stain may be the best choice, although it may show wear patterns.

### Fences

Fences probably have the most finishing options. Acrylic latex paints are better than oil-based paints, unless the fence is likely to be used for sitting. Highly colored woods such as redwood and cedar require a stain-blocking primer. Pretreating the wood, especially the ends, with a paintable water-repellent preservative (WRP) will increase the life of the paint.

### Artwork

Artwork made from logs or large pieces of wood is prone to crack and check as the wood seasons. Wood swells as it gets wet and shrinks as it dries. Because wood does not shrink evenly in all directions, it cracks. Chemicals can be used to stabilize this process, but they can be both difficult to apply and expensive. The chemical stabi-

The first choice of finish for artwork is a solventborne semitransparent stain that also contains a water repellent and a preservative. Clean and apply stain every few years as needed. If a film or gloss develops on the wood, you are applying stain too often.

If you choose paint, pretreat the wood with a paintable WRP before painting. Then, you can apply additional WRP as cracks and checks form. Wipe excess WRP from previously painted areas. Use an acrylic latex paint for the prime and topcoat because it is more flexible than other paints.

### Play Equipment

Like furniture, play equipment is subject to abrasion, so latex paint is not the first choice. Enamel paint

### Prolong the Life of the Finish

- Subject the wood to one or two wetting/drying cycles before you apply the finish; wet the wood (e.g., with a hose) and let it dry completely each time.
- Sand the wood before applying the finish.
- Apply paint to wood soon after