

2007 Final Summary of the bed wood finishes testing

In the [Summer of 2005](#) we began a test of 10 different wood finishes. The purpose was to get comparative test results of how well the finishes would last when left outdoors. We mounted 30 samples of bedwood boards with ten different finishes in a fixture that held them in a slightly inclined position, and left them outdoors to see when the finishes would fail or deteriorate. The samples are held in the fixture with unpolished stainless bedstrips and stainless bolts much the way bed wood is held in a truck bed.

After two years in the weather, all the clear finishes have failed and only the painted finish still provides full protection for the wood. Note the summers of 2005 and 2006 were very dry and 2007 has been unusually wet, with both rain and snow. It has rained almost every day in June and July 2007. The failures are different for each finish system. Based on our tests, a transparent "natural" finish is not recommended for applications where the bed will be outdoors all the time unless you are willing to repair and refinish about every year or two, much like is done on sail boats with decorative wood trim. Properly primed and painted wood will last a long time outdoors if the paint used contains a UV blocking characteristic intended for outdoors use. Unfortunately the UV absorber of transparent finishing products is not the same as the UV blocker used in exterior paint. That is why clear finishes gradually deteriorate and eventually are damaged by UV of the sunlight.

For a more recent update take a look at the [June 2010 Update here](#).

Following is a brief description of each finish and information about its failure in this test.

Picture	Coating	Failure	Observations
	<p>1. Oak boards, coated with one brushed heavy coat of CPES epoxy and three sprayed coats of Aliphatic Urethane. The Aliphatic Urethane was applied before the CPES was fully cured for best adhesion as recommended by the epoxy manufacturer, Smith & Co.</p>	<p>The ends of the boards developed several cracks and turned black.</p> <p>The color of the boards became noticeably darker, possibly indicating UV damage.</p> <p>Relatively few cracks in the center areas of the boards.</p>	<p>The adhesion appears to be very good. The topcoat only began to separate from the epoxy in the last couple months.</p> <p>CPES is water thin and somewhat difficult to apply in a heavy coat.</p> <p>Multiple coats of the CPES epoxy would probably have given better results.</p>
	<p>2. Pine boards, coated with one brushed heavy coat of CPES epoxy and 3 sprayed coats of Minwax Helmsman Spar Urethane. The Helmsman was applied before the CPES was fully cured for best adhesion as recommended by the epoxy Manufacturer, Smith & Co.</p>	<p>The ends of the boards developed cracks and became very black, no protection.</p> <p>The color of the boards became slightly darker during the test</p> <p>The topcoat is peeling from the epoxy.</p>	<p>Multiple coats of the CPES epoxy would probably have given better results, especially on the ends of the boards.</p>



3. Oak boards, coated with two coats of RAKA epoxy, cured one month, block sanded, and topcoated with three coats of automotive clearcoat.

Extensive separation of the coats, the topcoat often coming off in sheets.

Some cracks in the ends of the boards, some deterioration of the finish in the ends.

This sample was the most glossy finish of the ones tested in this series. Block sanding the epoxy then using automotive clear made a deep, shiny finish. This finish would be suited to an application requiring a "smooth as glass" finish if the truck is usually protected from the weather. Automotive clearcoat is water clear and does not darken the wood. Other finishes tend to make the wood amber colored even from the start and this one did not. The color of this finish system may not appeal to the user wanting the usual amber color of the wood to show through.



4. Oak boards, coated with one brushed heavy coat of CPES epoxy and three sprayed coats of automotive clearcoat. The clearcoat product was applied before the CPES was fully cured for best adhesion as recommended by the epoxy manufacturer, Smith & Co.

Ends of the boards have cracks and are totally deteriorated.

The topcoat is peeling, especially at the edges of the boards.

The boards were shiny but not as shiny as #3 above. The wood was not darkened during the test.

Automotive clearcoat is water clear and does not darken the wood. Other finishes tend to make the wood amber colored even from the start and this one did not. This finish system may not appeal to the user wanting the usual amber color of the wood to show through.



5. Oak boards, coated with two brushed coats of RAKA epoxy, cured one month, block sanded, and topcoated with three sprayed coats of Minwax Helmsman Spar Urethane.

All edges the topcoat is peeling up and separating from the epoxy.

The ends of the boards are deteriorated, not as bad as some other samples.

The center areas of the boards are not cracked.

The color has darkened somewhat since the beginning of the test.

The boards looked good from the beginning and lasted fairly well. This system provides good color and long lasting finish and may be well suited for the truck that sees occasional weather but not continuous exposure.



6. Oak boards, coated with three brushed coats of Pelucid three hours apart, cured 4 days, block sanded, and sprayed with three coats of Minwax Helmsman Spar Urethane.

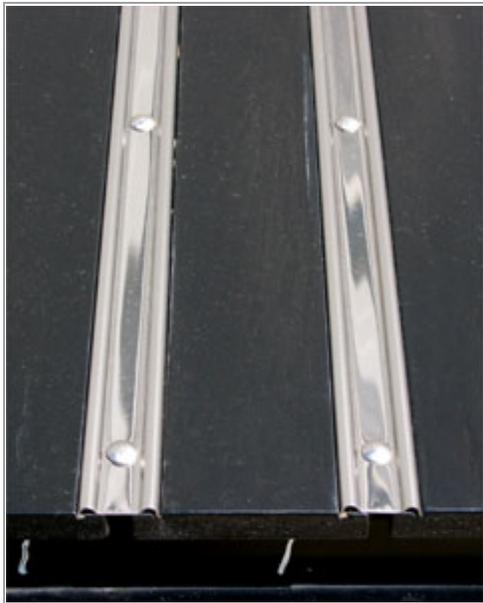
One bad end crack in one of the boards, causing deterioration on that board

Top coats are beginning to peel away from the Pelucid along some of the edges.

No cracks in the center areas of the boards.

The color has darkened some since the beginning of the test.

This is the most durable clear finish we have tested for oak boards. It should last well on a truck that is usually protected from the weather



7. Oak boards, coated with three brushed coats of POR-15 Rust Preventative Paint three hours apart, then three coats brushed Behr best quality black exterior latex enamel, three hours apart.

This coating has not failed. Only slight dulling of the original gloss. No other defects.

If a weather resistant finish is desired, this is the best system we have tested.



8. Oak boards, coated with one brushed coat Glisten, cured 24 hours, scuff sanded, and then three more coats of Glisten, one hour apart.

This system failed very early in the test, with only a few weeks exposure.

The finish is peeling, coming loose in large sheets.

This finish system is not suited to bedwood. We have used Glisten with success in finishing metal parts and as a clear coat to a color painted metal substrate. It is easy to use and provide a good gloss. It is not durable as a clear finish on wood that is exposed to the weather.



9. Pine boards, coated with three brushed coats of Pelucid three hours apart, cured 4 days, block sanded, and sprayed with three coats of Minwax Helmsman Spar Urethane.

Starting to peel in a few places along the edges of the boards.

The ends of the boards look good, with no cracks or deterioration.

The color has darkened somewhat. The surface is not nearly as glossy as at the start of the test.

This sample shows the least failure of any of the clear finishes tested.



10. Oak boards, saturated with several coats of heated linseed oil until it would not absorb any more, cured three months, wiped with turpentine to remove excess dried linseed oil from the surface, and when dry, sprayed with three coats of Minwax Helmsman Spar Urethane.

Excessive cracks and peeling.
Ends of the boards have totally failed.

This finish is not suited for a bedwood that will be exposed to any weather.

The finish has darkened considerably.

What have we learned?

1. Most of the samples currently tested have much greater durability than the single stage finishes tested in summer of 2004. It appears that finish systems which include a durable seal or primer coat followed by protective coats of high quality exterior paint or urethane varnish will provide a durable bed wood finish, significantly longer lasting than a finish with only the top coat material. Consider one of these finish systems if a weather resistant bed wood is desired.
2. The ends of the boards are most susceptible to deterioration and failure. Be sure the ends are fully saturated with the seal primer coat material.
3. Pine seems to be more resistant to weather damage than oak.
4. Painted finishes, with proper seal or primer coats, will last longer than clear finishes when exposed to the weather.
5. Even the best transparent finishes we tested would need to be refinished every two years or less if they are frequently exposed to the weather, such as in a daily driver.
6. Most of these samples eventually failed at the edges of the boards next to the bedstrips. Two possible causes:
 - a. Coating thickness may have been thinner at the edges. Coatings generally are thinner at sharp edges. We sanded the sharp edges of the wood before they were finished to give a slightly rounded edge but it may not have been enough. Additional sanding of the edges next to the

bedstrip grooves to about 1/8" radius may have improved the durability of the coatings.

- b. Expansion of the boards due to weather changes may have caused the bedstrips to become tight against the edges of the boards. Boards were cut and fitted to the fixture in the spring of 2005, a very dry and hot year. The extreme amount of rain and snow in the last 8 months probably caused the boards to expand and possibly weakened the finish next to the bedstrips. If we had allowed more clearance for movement of the boards due to temperature and humidity changes the finishes may have lasted longer. Be sure to allow clearance between the strips and the wood to allow for expansion, especially if the wood is going to be regularly exposed to damp conditions.