Food-Safe Finishes

By Bob Flexner

Let your nose be your guide

I doubt any issue has crippled woodturners as much as the controversy over food safety—that is, which finishes are safe to use on salad bowls and other objects that will come in contact with food.

So much confusion has been sown that many woodturners choose to "play it safe" and use walnut oil, mineral oil, or some form of raw linseed oil on their turnings, even though these finishes perform poorly because they don't cure well—or don't cure at all.

The shame is that this controversy ever got started in the first place. There has never been any evidence of a food-safety problem with any clear finish sold to woodworkers or woodturners. Only the widespread poor understanding of wood finishes in general has made this controversy possible.

Food-safe finishes

I believe the topic got off on the wrong path almost 30 years ago in *Fine Woodworking* magazine and is fueled by continued comments and cautions in much of the woodworking literature, especially articles written by and for woodturners. The existence of several brands of salad-bowl finishes also serves to perpetuate the controversy because these finishes are marketed as "food safe," implying that other finishes aren't.

Amazingly, the only legitimate issue in the entire food-safety discussion is the instructions on the cans of salad-bowl finish, which claim the finish is safe to eat off of before it has had time to cure adequately. More about that later.

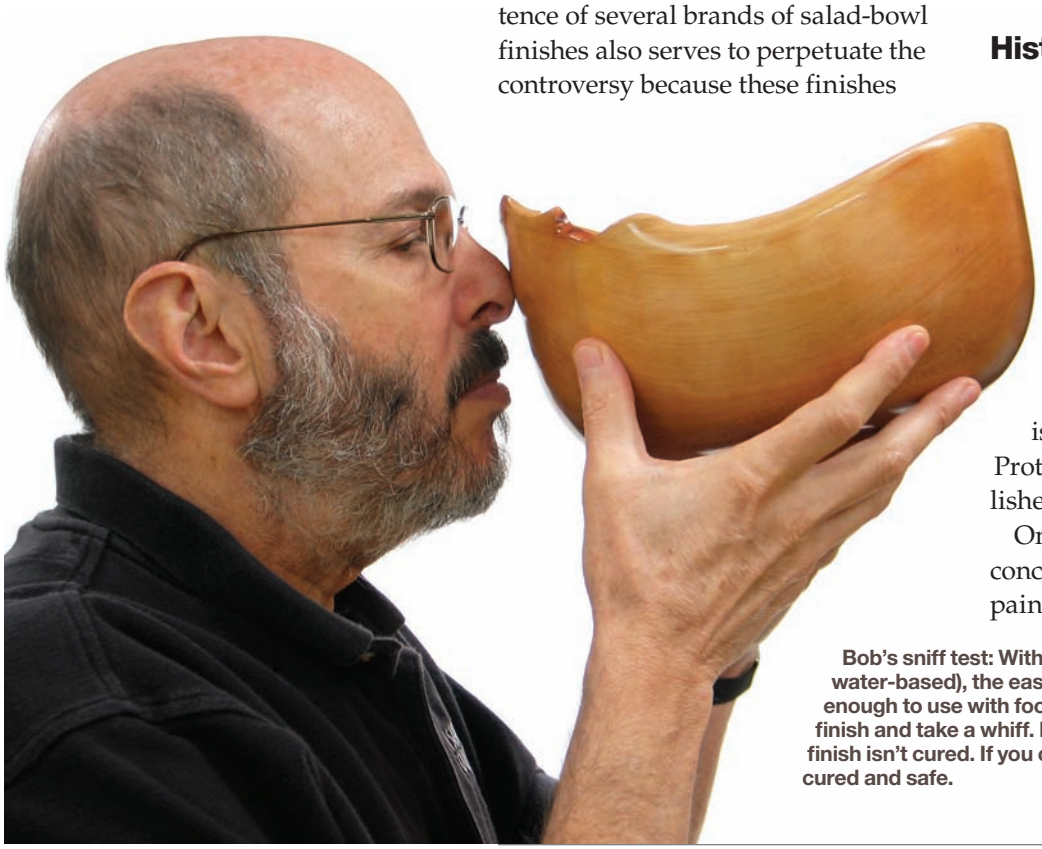
Most likely you are familiar with the controversy over food safety. You may have even seen or heard my name cited as an advocate for all finishes being food safe (a lonely position even though it seems so obvious to me).

History lesson

To fully understand the issue surrounding food safety and finishes, you need to know a little history.

As you may remember, the 1970s was a time not only of explosive growth in woodworking but also of increased attention given to all sorts of environmental issues. In fact, the Environmental Protection Agency (EPA) was established in 1971.

One of the environmental issues concerned the existence of lead in paint. Lead compounds make



Bob's sniff test: With any solvent-based finish (not water-based), the easy way to tell if the finish is cured enough to use with food is to press your nose against the finish and take a whiff. If you can still smell solvent, the finish isn't cured. If you can't smell anything, the finish is cured and safe.

pigments perform better, and many of the most effective pigments contained a large percentage of lead. The dust from these pigments, which resembles finely ground earth in its consistency, would settle on floors, get on children's hands, and then into their mouths. Some children chewed on paint chips containing the sweet-tasting lead pigments.

When ingested, lead causes mental and developmental problems in humans, especially in children whose brains are still maturing. So there was a widespread interest in removing lead from paint pigments.

Lead compounds were also used in very small amounts (usually less than half of 1 percent of the total solids) as a drier in oils, varnishes, and oil paints. (Driers are catalysts that speed the introduction of oxygen and thus the curing of these coatings.) This amount of lead wasn't enough to be a major concern like lead in pigments, but lead in driers was included in the efforts to remove all lead from consumer coatings.

The Consumer Products Safety Commission (CPSC) officially accomplished this in 1978, though most paint manufacturers had removed the lead from products several decades earlier.

You can read the CPSC directive on the Web by going to the AAW website and following the link to woodturner.org/foodsafe.pdf.

With the exceptions noted in this directive, including certain artists' paints, some industrial and agricultural coatings, and coatings on the backs of mirrors, paints and clear finishes no longer contain lead, or at least not more than a trace, .06 percent, or .0006 of the total solids, being the upper limit permitted The specialized coatings that still contain lead in greater amounts are required to state this on the label.

All clear finishes are safe to use on objects that come in contact with food. The finish on this bowl is wiping varnish—varnish thinned about 50 percent with mineral spirits to make it easy to apply. Several coats of wiping varnish produce a very nice sheen, slight yellowing, and excellent water and scratch resistance.

The finish on this hand-carved spoon is walnut oil, a finish that is popular with woodworkers who have been led to believe there is a food-safety issue. Walnut oil doesn't cure well so it leaves the spoon looking dull.

Thus, since 1978 there has been no reason to avoid using *any* oil or varnish finish (or consumer oil-based paint, for that matter) because of fear of lead.

Nonlead driers

Oils, varnishes, and oil paints continued, and continue now, to contain other metal driers because these are necessary for the coatings to cure within a reasonable time. These driers include salts of cobalt, manganese, and zirconium—bad-sounding stuff. And the bad "sound," rather than any serious research or thought, was and is responsible for creating the controversy about food-safe finishes.

It's too easy for someone without any technical knowledge to sound credible making statements such as, "I wouldn't eat off a finish that contains cobalt!" Or, "Why take the chance? You never know what we might learn about these substances in the future."

In fact, the U.S. Food and Drug Administration (FDA) considers these and other nonlead driers to be safe for food contact when used in coatings. Not only is the amount of drier in a coating tiny compared to the amount of pigment in paint, but also the drier is totally encased in the crosslinked finish once it has cured. Even if you were to eat a chip of a clear finish, it would simply pass through your system like any other plastic material, without causing any harm.

You can read the FDA regulations for coatings by Googling "21CFR175.300" and clicking on the current top link. For the approved driers, scroll to page 168 and then to (xxii). You'll find all the driers, which are salts of the various metals, commonly used in consumer finishes.

Both of these brands of salad-bowl finish are regular alkyd varnish thinned about 50 percent with mineral spirits. They contain metal driers from the same FDA list as do all varnishes (otherwise, they wouldn't dry). For almost three decades woodworking books and magazines have cautioned against using varnishes (and also boiled linseed oil) because of the included toxic driers, while simultaneously recommending the use of these salad bowl finishes as safe. This contradiction alone should make you question the validity of the food-safety issue in choosing a finish.

Keep in mind that the FDA lists the ingredients that can be used safely in food-contact coatings, but it does not "approve" the coatings themselves. Manufacturers are responsible for formulating these coatings so they cure properly.

Roots of confusion

So how did this confusion get started?

In the late 1970s when the existence of lead in paints and finishes was becoming an issue, *Fine Woodworking* was the only national woodworking magazine devoting attention to finishes. So in a sense, the magazine was in the wrong place at the wrong time. The responsibility for accurate reporting to the woodworking community fell entirely on its shoulders.

There were a few mentions of concern in *Fine Woodworking* about lead between 1975 and 1979. But the definitive statement, and the explanation that I believe got the controversy started, appeared in a short (one-third page) sidebar included in an article on oil finishes in the Nov./Dec. 1979 issue. I remember reading this sidebar at the time and finding it confusing.

The sidebar begins with the following statement:

"Many conventional clear finishing materials normally used for furniture and other interior wood surfaces contain compounds which, if ingested, are dangerous. Driers pose the greatest threat. Ordinarily they are composed of metals or metal compounds; driers containing lead are the most dangerous, but no amount of any metal can be considered absolutely safe. Drying oils such as linseed and tung and most varnishes contain metallic drier compounds. Even though the actual quantity of metal in a given amount of finishing material is small, little by little it can accumulate to dangerous levels in humans."

After explaining the possible safety hazards of these finishes on children's toys and food-contact surfaces, the sidebar continues:

"A report by the Safety Products Division of the U.S. Food and Drug Administration indicates that their major concern is with the presence of lead and mercury [used in latex paints] in a finishing material. The report concludes that as long as lead and other metals are not present, a finish can be considered nontoxic and acceptable for food service and toys."

Then after volunteering that lacquers and water-based finishes fall into the "nontoxic" classification, there are these two statements:

"Among the finishes approved by the FDA are Behlen Salad Bowl Finish…"

and

"The Watco-Dennis Corp. maintains that Watco oil leaves a solid, nontoxic finish, but stresses that at least 30 days should elapse between finishing and use of food utensils and children's toys to ensure complete polymerization."

No conclusion is offered. But the reader is clearly left with the impression that concern is warranted and it's best not to take a chance, even though the contradictions scream off the page.

Clearly, the author and the FDA don't agree on the toxicity of metals other than lead used as driers, or that "*little by little* [the approved metal driers] *can accumulate to dangerous levels in humans.*" But the author offers no evidence or explanation for his contrary views.

Nor does the author offer any explanation for Behlen Salad Bowl Finish and Watco Danish Oil being safe to use when both contained, and still contain, nonlead driers—even though this would seem to contradict his previous stated cautions.

Playing it safe

So from 1979 forward, confusion has reigned surrounding the food safety of various finishes. It was understandable that *Fine Woodworking* editors and editors of woodworking magazines that started up in the 1980s and 1990s would "play it safe" and caution their readers about which finishes were safe to use.

No one stopped to consider that there had been no reported cases of harm coming to anyone from any sort of contact with any cured, clear finish—that is, *any* cured, clear finish. Until someone was willing to devote the time and energy necessary to look deeply into this issue, the worry would continue.

Repeating the myth

In the March/April 1998 issue of *Fine Woodworking*, one of the magazine's editors tried just this with a three-page article. (After the 1979 sidebar, this is the only attempt I'm familiar

with, other than what I've written, to make sense of this issue.)

The author explained that he'd had *"scores of conversations with chemists and regulatory agencies, finish manufacturers, finishing experts and woodworkers,"* and yet he came away with an even more confusing jumble of information than the 1979 sidebar contained. Missing from the jumble was any evidence of any health problems with any finish.

Reading the article, however, one could only conclude that it was best to rely on the listed "edible" finishes such as pure tung oil, raw linseed oil, mineral oil, walnut oil, beeswax, carnauba wax, shellac, or nothing—no finish at all—just to be safe.

Cured is the operative word

Here's the real kicker. Throughout this three-decade-long concern over food safety, woodworking magazines have recommended salad-bowl finish as safe for food contact. Manufacturers had, after all, formulated this finish to be safe.

But salad-bowl finishes are simply thinned varnish, what I call a wiping varnish. They contain driers from the same FDA list, as do all varnishes on the market.

So the "play-it-safers" not only ignore the authority of the FDA and the total absence of any reported health problems from contact with nonlead-containing finishes, they also ignore the contradictions in their own recommendations.

Does this not make you question the legitimacy of this entire debate?

In the early 1990s, when I was researching my book on woodworking finishes, I called Behlen, the principal manufacturer of salad-bowl finish at the time, to ask how the company could market their finish as food safe when it must contain driers. The discussion went something like this:

"Of course, Bob, our Salad Bowl Finish contains driers. How else would it cure?"

"But… but," I stammered, "how can you call it 'food safe?' "

"Because it is. All varnishes are food safe. It's just a marketing situation. There's a big market for food-safe varnishes, so we simply label our varnish as such. We sell lots of this finish."

Obviously, marketing worked. But here's the most incredible assertion of all. The two national brands of salad-bowl finish currently available, Behlen and General Finishes, both claim on their containers that the finish is safe to eat off of after 72 hours—three days.

Cutting boards are cut on, of course, which defeats the purpose of using any finish to make them look nicer. In my opinion it's best to leave them unfinished unless you are selling them and find you can improve sales with a finish. Don't make the cutting boards look too nice, though, or people won't buy them because they won't want to mess them up.

Bob's sniff test

I suggest a simple test. Apply one or two coats of either product to wood and let the finish cure for three days in a warm room. Then put your nose against the finish and take a whiff, as shown on *page 36*.

Would you really eat off this surface? There's still paint thinner coming out! The finish isn't cured. At the very least, it will affect the taste of the food.

Wait until you can't smell any finish anymore. Then it's safe.

Remember, the FDA regulation requires not only that the ingredients used come from their list but that the finish also must be cured.

Conclusion

It's not possible to prove a negative. You can't prove, for example, that milk doesn't cause any sort of health problem and is totally safe (beyond a doubt). You can only assume it doesn't because there is absolutely no evidence it does.

The same is true for wood finishes that have fully cured. You can't prove that no harm can come from eating off them. But here again, there's absolutely no evidence that harm does come.

Until someone can actually produce evidence beyond the gratuitous "play-it-safe" warnings that a commercially available clear finish causes some type of harm, let's choose a finish for salad bowls and other eating utensils the same way we choose a finish for other wood objects: for water and scratch resistance, color, and ease of application.

Let's put the issue of food safety to rest and move on.

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