Is Watco Oil Dangerous? You Bet! Sneaky Too.

Ed Pretty

Aftermath of Watco Oil Fire
(photo by Ed Pretty)

At a guild meeting during a session on finishing, a cautionary note was mentioned to be aware that rags soaked in Watco oil were a fire hazard. A few turners offered various safety tips on how to deal with them – all sound. Clearly there were some who understood the hazard, but probably some who didn't. There is much more to be understood about this hazard so that those of us using this product and others like it can fully understand this hazard and better deal with it.

I recently retired as a firefighter after 36 years. During that time I personally responded to four incidents and have heard of others where Watco Oil was deemed the culprit. Watco was the medium, spontaneous combustion was the mechanism. Spontaneous combustion occurs when organic material decomposes. Heat is generated when this occurs and if that heat is allowed to be retained and build up it forms one side of the "fire triangle". Oxygen and fuel are generally also present in the form of air and the rag respectively, making up the other two sides. In this small amount of information there are the seeds of understanding what is happening and how to deal sensibly with the hazard.

Any natural product contains bacteria and given the right conditions will decay and generate heat. When I was a kid on the farm (you know… back in the day) it was not unusual to hear of someone's barn that burned down when hay ignited spontaneously after getting wet. We shoveled our oats and wheat feed from one crib to another so that heat wouldn't build up too much. Knowing what I know now, I'm sure that occasionally spontaneous combustion took the heat for financial combustion (sorry, I have to do that now and again). If you've ever seen a load of mushroom manure steaming as it goes by or steam coming off the compost pile, you have witnessed the kind of heat that can build up when things decompose and are kept bunched together.

Back to Watco. Watco contains raw linseed oil. Linseed oil on its own is normally purchased as boiled linseed oil. The heat does two things: it kills the bacteria so that decomposition doesn't occur and also essentially "polymerizes" it so that it will cure. Raw linseed oil simply leaves a gummy mess and perhaps dries but never cures. As far as I have been able to learn, Watco Oil contains raw linseed oil to which they have added driers (petroleum based solvents) to cause it to cure…so the bugs are still in there. Knowing this, if one looks at a product it is possible to determine if it may be a hazard or not depending on whether or not it is a natural product and what process it has been put through. Tung oil, for example, is a natural product. It also is "polymerized" by either heating or adding solvents. I have never personally heard of a fire related to tung oil but that may be due to two things: it is not nearly as widely used as Watco and/or it may be inherently more stable than linseed oil. Nevertheless knowledge is power, and understanding how something can generate its own heat is important. *(In addition to bacteria, chemical reactions can generate quite a bit of heat. Some curing finishes produce heat when they cure. These include varnishes and many glues such as epoxy. CA glue actually gets hot enough to burn you if you have enough of*

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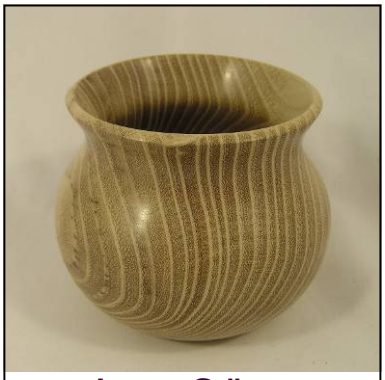
Instant Gallery:
Bowl - David Sweet - 10in x 5in - Red Cedar - Tung Oil

Instant Gallery:
Colander 1 - Kerry Deane-Cloutier & Dennis Cloutier - 4in x 2.5in - Beech - Pre-Cat Lacquer

Instant Gallery:
Colouerd Pieces - Merv Graham - Experiment In Colour Lacquer

Instant Gallery:
Bowl - Sandy Howkins - 16in x 10in - Maple



Instant Gallery:
Candy Dish - Allan Cusworth - 4-5in x 4in - Black Locust - Salad Bowl Finish

"I ... could feel heat radiating from a pile of oily rags "

Instant Gallery:
Hollow Form - Cindy Drozda Style - Gari Biasillo - 7in x 11in - Maple Burl & Walnut - Tung Oil

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it curing all at once. This type of heat generation can also lead to spontaneous combustion. To be on the safe side, I assume that all finishes can cause fires and handle the rags etc. accordingly. Ed.)

The mechanism isn't complete without the right conditions. The heat generated is insignificant unless it is allowed to build up. If the oily rag is left crumpled up and in some fashion insulated, this can happen – just like the barn full of hay or the crib full of grain. The conditions are definitely the wild card in my view, since I have tried to replicate the situation (in an isolated garbage can, OK) but have never been successful. Obviously things like ambient temperature, humidity, whether or not the bugs are having a good day, and who knows what else, plays a part.

So, now to using this stuff in a safe manner; you want to be able to leave the shop and sleep when you go to bed. You may recall that I mentioned something about a fire triangle: heat, fuel and oxygen. All three are required for a fire; take one away and the fire goes out – or doesn't start. Knowing that, one can use any of the sides to achieve your goal of… no fire. Removing the fuel is not all that practical unless you have some type of incredible centrifuge to take the oil from the rag – 100%. Removing the heat is easy enough by simply spreading the rag out – I open the rag and hang it - but that can be messy and doesn't truly leave my mind free to enjoy happy hour at the end of the day. It's sure OK for in between applications, though and not a bad habit, just in case you forget about them. There was one suggestion to put them in a bucket of water. That works but is even messier. The absolute best, easiest and neatest solution is to exclude oxygen by placing them in an air tight, non-combustible container. While special waste cans exactly for this are available, they are expensive. I have an empty paint can that I drop them into and just lightly tap the top on to exclude the oxygen. Even bunched together, the small amount of oxygen is insignificant and in any case would be used up before things got out of hand. Don't put them in the garbage until you take it to the curb.

I didn't want to bore you with war stories until I got the information down, but here are the four incidents, so you have something to think about. The first incident involved a fellow who "Watco-ed" his cedar around his hot tub every year (so he had done exactly this before with no problems). He finished the job, piled the rags in the corner, ready for the big clean-up the next day. He went inside, cracked a beer and sat down in the big easy to watch the game, but instead watched his deck almost explode in flames (Freshly oiled vertical T&G cedar? Yep, that'll do it). The second occurred when a van parked in the shop of a cabinet company on Friday at quitting time went up in flames on Sunday afternoon. A hurried clean-up at a job site left a pile of Watco soaked rags in the center of the van's floor. Vans don't count as an air tight container. The third didn't result in a fire but was oh, so close. We were investigating an alarm at a school that turned out to be an intrusion alarm from a break-in in the school shop. While checking the place to ensure it was secure from our standpoint, I just happened to lean against a bench and could feel heat radiating from a pile of oily rags – and a gallon can of Watco. The fourth was a fellow who put a new deck in a restored '40's pick up and oiled the wood with Watco. Same as all the others – he left the rags in a pile under the bench in his attached garage and they took off. It seems that took a few hours, thankfully before they turned in for the night.