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**TECHNICAL BULLITEN**

Making your own oil varnish

Unlike shellac, which when mixed with alcohol will dissolve, most varnish resins must be "run" or melted, sometimes at temperatures approaching 600 degrees Fahrenheit, and then mixed with hot oil to form the varnish. This means the safety of you and your space are a top priority. This really is more dangerous than cooking French fries. For higher temperature varnish-making, I move my work station outdoors.

Some oil-resin recipes call for only modest heat, while others require extreme heat and the utmost care in handling the materials. A portable hot plate (not an open flame) works fine. I use a sand bath setup, using a cast-iron cooking pot filled with enough play sand to push in my Pyrex mixing beakers to heat my ingredients. Putting a cold jar into hot sand will probably shatter the jar, so heat everything together from cold. Make sure to use heat protective clothing, eye protection and gloves that can withstand spills of scorching hot oil. If possible, handle the hot jars with beaker tongs or something similar.

Here are some of my favorite varnish recipes. All temperatures are in Fahrenheit, and, yes, you can use a meat thermometer, although I use a digital kiln thermometer myself. Other tools you will need include a thrift-store coffee grinder for pulverizing resins and a metal stirring rod.

One of the simplest old varnishes is to take one part of powdered mastic added to an equal part (by weight) of raw linseed oil, and slowly heat until the resin melts completely. It should not take much heat to accomplish this, so warm slowly and stir regularly; stirring does not have to be continuous. Once the heated oil dissolves the mastic resin, remove from the heat, add one part of turpentine or mineral spirits, and the formulation is complete. This varnish dries pretty slowly because there is no drier, but it performs well even if it does yellow a bit with age.

A little more complex formulation is two parts ground copal heated in a clean jar in the sand bath until it melts at about 600 degrees. Watch carefully and do not heat past the point where it is all melted. Add this molten copal to one part of hot (400 degrees) linseed oil and stir them together until it all cools down to about 150 degrees. Then add two parts Venice turpentine. When the mass has cooled, thin with mineral spirits or turpentine until it acts like you want. If it dries too slowly for your needs, add a teaspoon of alum or a dash of commercial "Japan drier" to speed up the hardening process. Sometimes I put a dab of lead white artist's oil paint into a jar of varnish to make sure the reaction goes well.

An even more complicated varnish is one part pulverized amber and one part pulverized copal each in their own jar, melting in the sand bath. These must be heated until they melt or "run" at about 600 degrees. Do not overheat. As soon as they melt, they should be added to a jar of four parts raw tung oil that has been cooked (350 degrees) for three hours in a clean jar. (I drape a piece of metal window screen over the ingredients as they are cooking to keep dust and insects out.) Like the previous recipe, add one part Venice turpentine when the soup is warm. Again, once the mixture is complete, I add diluent and drier to suit my particular need.

And finally, here is my interpretation of the historic Vernis Martin recipe that was touted as the ultimate varnish 200 years ago. There are a couple of versions of this recipe in the historic literature, and quite frankly neither makes perfect sense to me, so here's my take on the subject: Take four parts Venice turpentine, eight parts of powdered amber, and one part powdered copal, and cook them together at about 350 degrees until the concoction is homogenous (30 minutes or so). At this point it will probably be a cloudy soup with the consistency of heavy syrup. Crank up the heat in your sand bath to about 600 degrees and watch carefully to see when everything melts and the solution becomes honey-clear, then turn off the heat. Once the solution cools just a little, add one part hot linseed oil. When cooled completely give it a test drive, and add diluent and drier as needed. Historically the drier of choice would have been lead white or litharge, a red lead pigment.

Making and using oil-resin varnishes takes a bit of preparation and practice, but it can yield an attractive, robust, historically accurate surface that makes it worth the effort.