

## Using Clear Penetrating Epoxy Sealer™ (also known as CPES™ as well as MultiWoodPrime™) as a Primer for Paint or Varnish

Our goal is to have your paint or varnish stick well to your old or new wood, last a long time, look beautiful and protect the wood. We must start with dry wood and keep it away from water, rain or dew through the entire priming and painting process. Sometimes a paint stripper must be used to remove old paint or varnish in fine detailed woodwork. Sanding or a heat gun is far preferable, as they leave no chemical residues in the wood. If you must, you can use Peel-Away #1--only the #1 product; you can also use the common solvent MEK. Call 1-800-234-0330 for our Stripping Paint application note.

Now, with the wood clean and dry, we are ready to start the priming process. A chain is only as strong as its weakest link, so remove any old finishes. Small flakes of old varnish down in the grain of the wood are usually not a problem, as they end up glued down and encapsulated.

Sand the wood to a moderately smooth finish; grits finer than 220 are unnecessary. Brush or vacuum to remove wood dust.

The application of any clear finish to wood will darken the wood as it brings out the rich natural color of the wood. Here is how that works: The clear resins fill up the spaces between the wood fibers so that light is guided down in-between the wood fibers and reflected off the colored resins inside the wood. Light scatters off the surface fibers of unfinished wood, so it looks lighter in color.

If staining is desired, use an "oil-base" stain. We definitely do not recommend any waterborne stains, water-cleanup stains or latex stains. The sealer does not bond to the acrylic resins that are commonly used in latex products, and acrylic resins would be coating the wood fibers. If the sealer cannot soak into the wood and glue onto the surface fibers of the wood then the bond will be weak, and this is the bond that holds the varnish to the wood. Allow the stain to fully chemically cure before proceeding. This usually takes 3-4 days.

Important: Some stains have dyes which bleach with time. It is your responsibility to

choose a durable stain. Also, a finished varnish film too thin will show early wood bleaching from the ultraviolet from the sun. If you are varnishing something that stays indoors you should know that fluorescent lighting has about fifteen percent of the ultraviolet of sunlight.

Apply CPES slowly and methodically to the wood until no more will soak into one area. This is done by keeping the wood wet until no more soaks in.

Brushing, roller or immersion are the most practical methods of application for individual projects. Actual immersion of wood is ideal and is the preferred production-volume application method. Immersion a second time a few days later is recommended, to further seal the remaining surface porosity. If the days are hot this is best done later in the afternoon.

Allow the sealer to fully cure, which may take 2 to 4 days depending on the weather.

If brushing, you may end up applying a few coats over a period of a few days. Here is how that would go:

After the first saturating application, Sand lightly, only if necessary, using 220~320 grit to remove any raised grain or foreign material, and only to take down the high points. Wipe with surface-prep cleaning solvent and paper towels to remove sanding debris. While invisible, it can cause "craters" or "holidays" in the varnish. It will surely cause little bumps.

Next, apply one more coat of the CPES. If the wood was so porous that some does soak in, repeat the application. When it shows a glossy film everywhere, meaning it is no longer soaking in upon application, the surface is sealed. Now allow enough drying time that film shrinkage from final solvent evaporation does not telegraph the grain pattern to the surface. Telegraphing is a technical term, commonly used. It means waves and cracks below will show up on the surface above, and this can go on, coat after coat. It is one of the reasons people sand between coats.

With very porous wood, the sealer may soak into porous growth rings and build up on the more dense growth rings. After a few applications of

CPES it may be necessary to sand with 180-220 grit to entirely level the surface. In that case wipe afterwards with a suitable cleaning solvent such as Aromatic 100 or painter's naphtha, and apply another coat of CPES.

You must pay attention to the condition of the wood and the behavior of the CPES during application. If the wood porosity is not sealed, then you will have bubbles in the varnish.

Sanding the CPES smooth and filling all the grain of the wood with this resin system is how one obtains a mirror-smooth varnish topcoat. The old way of varnishing, the "traditional" way, is to sand the topcoat layer by layer to obtain a mirror-smooth varnish topcoat. The modern, efficient way is that one starts varnish application with an adequately smooth surface. Grain-filling of the wood is done with the CPES resin system, not the varnish. Irregularities in the varnish topcoat are normally handled by spraying from the correct distance, thus avoiding orange-peel, and enough of a slow-evaporating solvent in the topcoat to give film leveling. Brushed finishes are often adequate. Varnish is usually sanded between coats because the varnish itself does not stick to the prior coat without sanding. Some modern varnishes have remedied this deficiency. It is still common to sand between coats of varnish because dust, bugs and weed seeds often end up blown into a fresh coat of varnish. The same problem exists with the CPES primer. The whole point of multiple coats and sanding here is to start varnishing with a smooth surface.

There must be adequate time after application of CPES for the solvents to evaporate, such that there is no further film shrinkage into the grain of the wood. Even with adequate film drying, the wood itself must be properly conditioned to not exhibit shrinkage and loss of volatiles, or there will be unavoidable grain telegraphing.

The final coat of CPES is the adhesion-promoting primer, and the first coat of varnish must be applied after the solvents have evaporated, but before the CPES resins have fully cured. If you apply that last coat of CPES in the afternoon, then apply the first coat of varnish the next day. The reason CPES works this way as an adhesion-promoting primer is that it is designed to be VERY slow-curing. It actually takes several days, so it finishes curing after the first varnish coat has cured, and thus glues down the varnish with a

flexible epoxy glue.

This product is available as a Warm Weather Formula and a Cold Weather Formula. If you are working in a day-to-night temperature range around 30° - 60°F, use the Cold Weather Formula. If you are working in a day-to-night temperature range around 60-90°F, use the Warm Weather Formula.

You may apply your varnish in any manner you see fit, and with the guidance of varnishing professionals. This application note is to help their advice to be more effective, in giving you an excellent varnish finish that really lasts.

There is one final bit of advice about varnishing, and that is to use enough of it that you end up with a minimum adequate film thickness on the wood, that there is enough of the ultraviolet absorbers in the varnish to protect the underlying wood. A pint of varnish used over no more than every ten square feet usually gives an adequate film thickness.

It does not matter how many coats you apply, or how much you thin the varnish, or how little. What matters is the dry film thickness. If you do a lot of sanding between coats, you are removing some of that dry film thickness and you need to use more varnish. If you sand off half the varnish you apply, for example, then you will need to budget a pint for every five square feet.

My goal is to have your varnish job look great, year after year. This advice comes from 35 years of experience of my customers, using my products and anyone's varnish, and getting great results. Call us at 1-800-234-0330 and we will get you hooked up with the nearest retail outlet or ship direct from our Factory Store. If you are happy with the results, then please tell your friends, and if it is not in your local paint store, ask them to stock CPES for your next project.