Gluing Oily Tropical Hardwoods (2)

by Eric Meier

Conventional wood glues like Titebond are water-based, and they rely on penetrating into the grain of the wood, and then (once the water has evaporated) hardening, leaving a bond that is in many instances stronger than the wood itself....

The Problem:

Many tropical hardwoods are so oily or resinous that they're practically waterproof. It would then stand to reason that if conventional wood glues need to penetrate into the wood in order to obtain a strong bond, then these oily woods would present a challenge in gluing...

They're technically not waterproof: since *all* wood contains some degree of moisture that changes depending upon the relative humidity of the surrounding air. But for most intents and purposes, in the short amount of time that is elapsed in the gluing process, so little of the glue sinks down into the wood grain that it is essentially waterproof, or perhaps more accurately, *glueproof*.
Between different types of wood, and even within the same species of wood, there can be a lot of variability in oil/resin content, and gluing success/difficulty. Sometimes an oily wood can be glued with regular yellow glue with no problems, and in the next instance, the glue joint will almost fall apart on its own.
It would be preferable if the objects which we are building would stay in one piece!
So what can be done about this unpredictable nature of wood?

Some Solutions:

Please note that these are some solutions that can help give consistent results in gluing troublesome woods; but it is by no means a cure-all that is guaranteed to work every time, with all wood species and with all types of wood joints. On the whole, employing these tips should result in generally stronger, longer-lasting glue joints in oily woods...

1.) Wipe the wood surface with a solvent prior to gluing.

Since the primary problem that tropical woods present in gluing is their oiliness, (with density probably being the second biggest problem), any of these natural oils and resins that you can remove from the wood surface will help the glue adhere that much better. While it's not a cure-all, wiping the wood with a solvent first goes a long way. But you have to be sure of two things: first, you should try to glue the pieces of wood to be joined as soon as possible after the solvent has evaporated from the wood surface. This is because the wood's oils will tend to migrate back to the surface of the wood where you removed some of the oils. Secondly, you have to be sure that the solvent you're using is actually dissolving and removing the wood's oils. A good way to gauge this is by checking the towel that you're using to wipe the solvent to see if it's changed to the wood's color.

Note:

If you're initially testing a solvent, make sure that the wood is clear of any small particles of sawdust that might make it appear as though the towel is being discolored. Try a cloth with water first as a baseline: it should basically stay white since the water does not dissolve the wood's heartwood extractives. Some common solvents that you can try are: acetone, denatured alcohol, lacquer thinner, mineral spirits, and naphtha.

2.) Sand the wood to help open up the grain.

You'll notice that sometimes on particularly dense woods, just after they're out of the planer, that they almost have a shine to them. This is because the blades of a jointer/planer can actually burnish the wood as it passes through the machine. Sanding helps to break up this flattened/polished surface so more glue can penetrate into the wood. It's tempting to take the wood straight from the planer or jointer and glue it immediately, but for stronger joints, especially in dense woods, it helps to sand the wood with medium-grit sandpaper before it's glued.

3.) Use synthetic, non-water-based glues.

Since water is repelled by the wood's oils, using water-based glues like Titebond® can pose problems—though Titebond® II or III are usually better at gluing oily woods than Titebond® Original. Instead, use glues that aren't water based, and/or glues that can bond a wider variety of materials like plastics and other non-porous surfaces (since that's practically what we're doing with these exotic woods anyways).

A List of Troublesome Woods:

Wood	Gluing Notes
Bubinga	High density, closed pores, and natural oils can cause problems with glue penetration.
Bulletwood	High density and moderately oily.
Cocobolo	Very high oil content and high density.
Cumaru	High oil content and high density.
East Indian Rosewood	High oil content and medium/high density.
Ebonies	Some oil present, along with very high densities.
Ekki	High density and moderately oily.
Goncalo Alves	High density and natural oils prevent water absorption.
Greenheart	High density and natural oils.
Honduran Rosewood	High oil content and high density.
Ipe	Reportedly very difficult to glue in exterior applications, especially for the long term.
Katalox	Very high density, along with natural oils.
Kingwood	Very high oil content and high density.
Lignum Vitae	Extremely high oil content and density can pose gluing challenges.
Osage Orange	Oils present can give gluing problems.
Purpleheart	High oil content and high density.
Rosewoods	Typically very oily and very dense.
Santos Mahogany	High density and moderately oily.

Teak	Oils/resins can present challenges in outdoor applications.
Verawood	Extremely high oil content and density can pose gluing challenges.