

# Shellac Recipes and Application Details

## Recipes

#1 cut (sealer coat):	56.25g Shellac flake 500ml Shellac reducer
#2 cut	112.5g Shellac flakes 500ml Shellac reducer
#3 cut	168.75g Shellac flakes 500ml Shellac reducer

Mix ingredients together and let stand overnight. Decant clear liquid into another container, leaving residue in original for the next make up. Diluted solution should be used within three months.

Sealer coat should only be used if an oil primer is not being used for the first coat. Do not use a sealer coat if you are refinishing a previously finished shellac surface.

Generally a #2 cut is the best to use. A #3 cut would be used to provide a deeper colour in a shorter time.

The next page contains general application information.

## Shellac Application Guidelines

Applying shellac is a low-tech process that is perfectly suited to the professional and amateur finisher. The process uses shellac, which is a natural resin, and shellac reducer, also known as de-natured alcohol, which is methylated spirit without the purple dye. Shellac dries fast, so dust should not pose a great problem. It is a good-looking, durable finish that can be easily repaired if damaged.

The materials for applying or "padding" shellac are inexpensive and easy to obtain. They consist of shellac and shellac reducer, padding cloth, and a drying oil such as Tung oil. With the exception of padding cloth, these materials are available from Natural Oils.

### **THE MATERIALS:**

**Shellac:** Natural Oils supplies shellac in the form of dry flakes only, and not as a premixed solution. The use of fresh shellac flakes avoids one of the biggest problems with shellac as a finish - it won't dry. Shellac contains organic acids which react with alcohol in a chemical reaction called esterification. This gradual reaction produces esters which are gummy substances that inhibit the drying of the shellac. When using premixed shellac, it should not be older than 6 months. If it is older than 6 months, or you are unsure of its age, it should be tested for possible drying problems. To do this, place a drop or two of the shellac solution on a piece of glass. If it is not dry to the touch within 5 minutes, don't use it. Shellac flakes are available from Natural Oils Ltd as orange or blonde de-waxed. If you make the shellac solution yourself, make just enough to do each job, and you will be guaranteed a fresh solution every time.

**Alcohol:** There are four suitable alcohol solvents for shellac - methanol, ethanol, propanol and butanol. Methanol is probably the best to use, but like most solvents, it is toxic, even though it is a natural product. Ethanol (the alcohol used in alcoholic drinks) has low toxicity and can be used if toxicity is an issue. Butanol has an odor which people may find disagreeable. Propanol, (the alcohol in rubbing alcohol) can be hard to get in chemically pure form but it is a good solvent for adding to shellac solutions as a retarder. The shellac reducer supplied by Natural Oils is de-natured alcohol (methanol).

**Padding Cloth:** The padding cloth for applying shellac can be purchased from paint or hardware retailers. It can be known as padding, trace, or French polishing cloth. For use, the cloth should be clean, lint-free and absorbent.

**Oil:** Use either Tung oil or boiled Linseed oil as a sealer coat. This will give greater depth to the finish. A very small amount is used, and there is minimal difference in the finish between the two oil types. Natural Oils sells pure Tung oil only.

### **PREPARATION:**

Surface preparation is critical to a good finish. Sand generally to a 180 grit finish. On highly visible and critical surfaces such as tops and sides, sand to 240 grit. If the wood is to be coloured, use a non grain raising stain. If you have to smooth the wood off after the stain has dried, use a maroon synthetic "Scotchbrite". (This won't cut through the stain on the edges).

### **OILING:**

The purpose of this step is to seal the wood and give it greater depth of colour. When re-finishing pieces, this step can be omitted. The amount of oil that is used should be very little; perhaps 80 - 100ml per square metre is all that is needed. Apply just enough to deepen the colour of the wood. Do **not** flood the surface with oil. Apply the oil with a clean soft cloth, and rub it well into the timber. On very dense hardwoods such as oak, matai, eucalyptus etc, the oil may need to be thinned 10:1 with a suitable solvent to aid penetration. Either gum (vegetable) turpentine or citrus turpentine is recommended, but mineral turps should work just as well. Once the timber has been oiled and is dry, the shellac may be applied.

### **PADDING SHELLAC:**

Fold the cloth so as to make a pad that can be held with the fingers. There should be no creases or seams on the bottom of the pad. Pour approximately 25ml of shellac reducer into the pad, working it well in. Then pour about 10 – 12ml of shellac solution into the bottom of the pad. (Keeping your shellac solution in a round squeeze bottle simplifies dispensing into the pad).

Working with the grain of the wood, and starting at the top of the board, bring the pad down lightly and drag it across the timber - right off the opposite edge. Repeat the stroke, but in the opposite direction. Continue this alternating stroke down the board. When you've reached the bottom or end, start again at the top - it will be dry enough for you to repeat the same sequence. Keep doing this until the pad is dry, and then recharge it with more shellac. On tops, do the edges first after recharging the pad, then continue the same sequence as above. If there is a complex moulded edge, work the pad into the shape of the molding. Give the other parts of the piece a padding coat of shellac - legs, and sides etc. When the board is tacky and the pad starts to stick, stop and store the pad in a jar with a screw top lid.

After the first application of shellac it should be dry enough to scuff sand in approximately 1 hour. Using 320 grit steared sandpaper (aluminum oxide mixed with zinc stearate as a lubricant) lightly scuff sand the surface of the shellac applying just enough pressure to scuff the surface. After scuffing, and if needed, smooth out the surface using a maroon synthetic scourer. Then apply shellac in the same manner as above to the other sides of all surfaces, undersides of tops, insides of cabinets, etc. When this is dry after an hour, scuff sand and smooth these surfaces as above.

The sequence is then repeated - starting at the top of the board and working your way down. The pad should glide easily over the surface and you should have an even coat of shellac on the surface. As the pad starts to dry out, you can switch from a stripe pattern to polishing in a circular pattern or a series of figure eight's to get even coverage on the board. Replenish the pad with more shellac, (a good squirt from the squeeze bottle), and stripe the shellac on the board. Stop when the finish is tacky and the pad sticks. At this point, the surface should have an even shine, indicating a surface build of shellac. Put the pad back in the jar and let the finish dry overnight.

The next day, examine the finish. You should have an even coating of finish on the surface. If you are working with open grain timber like teak, oak, walnut or mahogany, you will see the outlines of the open grain. This level of finishing may suit some people, and the process can stop. Move to the "rubbing out" stage at the end to finish. For surfaces that will receive a lot of wear and tear you may want to apply several more applications for maximum protection. Either way, the choice of whether or not to build up more finish is up to you.

If you want to apply more shellac, repeat the scuff sanding and scouring sequence as above and apply more shellac. Start with striping the board and then switch to circles as the pad dries out. Recharge the pad at least 3 or 4 times, and when the surface is tacky, stop. This step should take about 10-15 minutes on a .600mm square surface. Let the piece dry overnight. Then scuff and scour as before reapplying more shellac. Repeat this procedure until you've built the finish up to the film thickness that you want. After 4 or 5 applications, there is no more wear resistance; only the aesthetic look that a thicker finishes brings. Repeated applications of shellac with 320 grit sanding in between is a method that can be used to completely fill the grain in timbers such as oak, teak, mahogany and walnut. If the finish is thick enough, the surface will be completely smooth, removing the outline of the grain.

After the final padding application, let the project dry for several days before proceeding to the rubbing out step below.

## **RUBBING OUT:**

Rubbing out the shellac finish results in a smoother, better looking surface finish. The first step is to take some 600 grit or higher wet and dry sandpaper, or 0000 steel wool, and level the surface of the finish. Squirt some mineral spirits onto the sandpaper, and then lightly polish the timber, working with the grain.

## **MAINTENANCE:**

For further protection, the surfaces can be waxed, which should give a higher sheen level. Suitable furniture polishes are Organoil Natural Wax and Polish or Liberon Black Bison Wax (Clear). Both are sold by Natural Oils.

If the piece is not subjected to a lot of wear and tear, a yearly re-waxing is sufficient. For tables, chairs and other high wear items, the finish can be rejuvenated by removing the wax with mineral spirits and a maroon Scotchbrite. Then apply a light coat of shellac, let dry and re-wax.

For information on shellac and how it is produced, please scroll to the next page.

# Shellac (Laccifer lacca)

Shellac, a wholly natural product, is known in many different branches of industry. Its range of uses covers a whole spectrum, from fabrics to eye shadow and from paint to sealing citrus fruit. As a food additive it is often on the tip of ones tongue and yet very few people have any detailed knowledge of shellac.

Natural Oils' aim is to further promote shellac as an ecologically beneficial alternative to synthetic chemicals, particularly in the furniture finishing and refinishing industry.

The producer of the raw material begins life as an insect larva not longer than half a millimetre crawling along the branches of special host trees and bushes in search of succulent new shoots. When these shoots are found, hundreds of larvae pack together to begin feeding. The Lac insect inserts its proboscis into the soft new wood and sucks up the sap. At the same time, special glands secrete a purple-red resin which forms a crust of between 3-10 mm. This crust protects the brood from high temperature and predators whilst they feed and mature.

Laccifer lacca is widespread throughout South East Asia but it is only in Thailand and India that optimum conditions are found, as a hot wet climate is equally important to both insect and host plant.

After 6-8 weeks of feeding beneath the protective crust, the insects are mature enough to breed. The male dies, and the female now increases her secretion of resin and enters the final stage of her life cycle laying up to 500 eggs. The resulting larvae swarm in search of new plant growth and the whole cycle of breeding and resin secretion starts again.

It is this resinous secretion which gives us Shellac. It takes about 100,000 of the parasitic Lac insect to produce one kilogram of raw shellac. When harvest time arrives, the branches of the host trees are encrusted with the resinous secretion of the Lac insect. This encrustation or stick-lac is scraped off the branches by the growers and sold to processors. The quantity and quality of each crop depends mainly upon the health of the host tree and climatic conditions. Storms, hail or persistent drought will cause a poor harvest. After chopping, the resin is separated from the wood and the Lac dye is washed out. After drying, the resin is again sifted to leave what is known as Seed Lac. Seed Lac has a characteristic yellow/red tint which is due to the presence of a water insoluble pigment, as well as about 5% dirt. Further processing can be done either by hand or by machine. If hand made, the Seed Lac is packed into long, narrow cotton bags and heated over an open fire until molten Lac can be squeezed out of the fabric, leaving all the impurities behind. The molten Lac is then stretched between the hands and feet to form a thin sheet which can be broken up after cooling, into small pieces called flake shellac.

During machine processing, the seed Lac is heated in vats then pressed through filters and stretched into long thin sheets which are cooled and broken to produce the flake shellac. This flake shellac has a natural wax content of between 3-5% and, as such, is mainly suitable for furniture polish, wood primers and sealing compounds etc. Due to its non polluting and non toxicity, shellac is being used in more branches of industry every year. Many manufacturers have developed shellac in various ways for use in the following areas: food, pharmaceuticals, cosmetics, paints and varnishes, leather finishing and inks for food packaging.

Shellac is food safe, and can be used to finish children's wooden toys, playpens, bassinets etc.

An increase in awareness about environmental issues is leading a move back to shellac and away from synthetic polymers. Varnishes containing shellac are not only non polluting but are in some cases longer lasting and more brilliant.