Tung Oil

Traditional Finishes Series

Don Jones - Customer Care Team
Email: djones@carbatec.com.au

carbatec
THE HOME OF WOODWORKING

Introduction

Tung oil is a very popular finish because it is a natural oil derived from the tung nut that dries into the wood surface. After it fully cures - usually between 5 to 30 days, the result is a very hard and easily repaired finish. It has traditionally been used on furniture, boat decks and timber floors.

Tung oil is a drying oil obtained by pressing the seed from the nut of the tung tree. Tung oil hardens upon exposure to air (through polymerization), and the resulting coating is transparent and has a deep, almost wet look depending on the number of coats applied.

Traditionally, it has been used mostly for finishing and protecting wood, after numerous coats, the finish can even look poly-like. The oil and its use are believed to have originated in ancient China and appear in the writings of Confucius from about 400 BC.

Raw tung oil tends to naturally dry to a fine, wrinkled finish; the English term for this is “gas checking”. This property was used to make wrinkle finishes, usually by adding an excess cobalt drier.

To stop the wrinkling effect, the oil is heated to gas-proof it. Most oils used for timber coating are gas-proofed - also known as "boiled". So the boiled version is used for most wood finishes and as an additive for other related finishes which have additional ingredients mixed into the oil.

Types of Tung Oil

Many manufacturers of furniture finishes and polishes may refer to their product as “tung oil”. In most cases however, they often contain additional additives to either the raw or boiled oil.

The oil is often diluted with hydrocarbon thinner so its viscosity is very low and enables the oil to penetrate the finest grain woods. This thinning vehicle evaporates within 15 to 20 minutes and results in a totally green residual finish. When applied in many fine/thinner coats over wood, tung oil slowly cures to a matt/light satin look with slight golden tint.

As a general rule, the more coats that are applied, the more gloss the finish becomes. Tung oil resists liquid water better than any other pure oil finish and does not darken noticeably with age and is claimed to be less susceptible to mould than other finishing oils such as linseed oil.

Most important, of all the oil finishes, tung oil is the only drying oil that polymerizes 100%, meaning that it completely hardens through a curing process. The polymerization process is a chemical reaction to air which results in it turning into a hardened finish on the wood. Linseed oil, for example, never completely hardens and leaves a residual trace on the wood.

As the oil does start a chemical reaction when exposed to the air, it is important when storing tung oil to do so in an airtight container. It is also important to try and expel as much of the air as possible from opened containers by either crushing the container or using an air expeller.

How To Use Tung Oil

The traditional technique for applying pure tung oil is to dilute the oil 1:1 with a solvent, then apply a succession of very thin films with a soft, lint-free cloth such as tee-shirt cotton.

Dilutents range from traditional spirits of turpentine to any of the new citrus-based thinners such as turpene, or naphtha. The choice of thinner should be guided by how fast the coating needs to set and the type of project to which it is being applied.

Primary coats may be laid down at a 1:1 oil-to-thinner ratio, and successive layers, if not absorbed into the wood, at higher solvent to oil concentrations. This technique brings out the deepest color of the wood while maintaining a matte finish.

Tung oil finishes that start with polymerized oils or tung oil preparations are best applied in the “fat over lean” principle: thinned pure oil is applied to deeply penetrate the surface, to fill pores. Straight oil is then applied moderately to adhere to the surface and provide a good base for the thick final layers. The polymerized oil is then applied thickly as a single layer and allowed to fully dry - usually a minimum of 24 hours. After that it is buffed smooth with very fine sandpaper such as a 500+ grit, then 0000 steel wool.

The surface is wiped clean with a moistened rag, then allowed to dry, again for a minimum of 24 hours. A final coat is applied fairly thickly (the oil will smooth itself into a glass-like coating) and allowed to dry for two to three days. Rags soaked with tung oil can spontaneously combust, so care in their disposal should be taken.

Dry or Cure?

Tung oil results in a hard finish on the wood, but it doesn't happen by evaporation. Chemists classify oils as "non-drying", "semi-drying", and "drying". The word "drying" is misleading because the oils don't really "dry" or evaporate; they "harden" or cure.

The most commonly known drying oils in woodworking are tung oil and linseed oil. They polymerize or solidify by a chemical process that requires oxygen (from the air) to create cross-linked compounds that make the oil get hard little by little, until it completely solidifies and becomes a hard finish.

By way of comparison, boiled linseed oil does not cure fully but leaves a residual film on the wood. Here is how they compare:

Boiled Linseed Oil	**Tung Oil**
Has added metal compounds	Pure, natural oil
Fast drying (due to compounds)	Recommend 24 hours between coats
Yellows with age	Does not discolour
Can go rancid	No
Can mildew	No
Is NOT waterproof	Is waterproof
Can become brittle	Retains flexibility when hard
Cheap	More expensive (in comparison)

Food Safe?

Tung oil is safe to use on food surfaces like counters and cutting boards. Some people may be allergic to nuts in a broader sense, but the incidence of allergies to tung oil is unknown.

Tung oil is derived from tung nuts from the tung tree (species Aleurites fordii). However, they are not true tree nuts. They are the seeds of the fruit (drupe) like the seed inside a peach pit. Aside from woodworkers, people would rarely, if ever come into contact with tung nuts or the liquid oil.

As the oil, when applied to timber and exposed to air cures to a hard, solid finish, it is a food safe finish.

Notwithstanding this, it is recommended that the wearing of appropriate personal protective equipment when handing and applying oil and any other finishes to timber. This includes gloves, eye protection and applying the finish in a well ventilated area.

More Resources

Facebook:
www.facebook.com/carbatec

Web site:
www.carbatec.com.au

YouTube:
https://www.youtube.com/channel/UCaeLLFiWrysejihA-hZ9ehw

Customer Care Team:
1800 658 111