

Pure Tung Oil Wood Finish – Technical Material Specification

1.0 Material Overview & Common Uses

Pure Tung Oil is a natural, non-toxic drying oil extracted from the seeds of the tung tree (*Vernicia fordii*). It is widely used as a wood finish for its deep penetration, water resistance, and durable, matte sheen. Unlike linseed oil, tung oil does not yellow significantly over time, making it ideal for fine furniture, butcher blocks, cutting boards, musical instruments, and marine woodwork. It cures by oxidation, forming a tough, flexible film that enhances wood grain without a plastic-like coating.

2.0 Core Technical Properties & Sizing

- Density: 0.937 g/cm³ at 20°C (typical for pure tung oil)
- Viscosity: 200–300 cP at 25°C (unthinned, varies by source)
- Iodine value: 160–175 g I₂/100g (indicates high unsaturation for oxidative curing)
- Saponification value: 190–195 mg KOH/g
- Flash point: >300°C (closed cup) – not classified as flammable under WHMIS
- Volatile Organic Compounds (VOC): <5 g/L (pure, unthinned) – meets stringent environmental standards
- Standard packaging: 1 L, 4 L, 20 L pails; 200 L drums
- Shelf life: 2 years from date of manufacture when stored unopened in original container

3.0 Processing, Machinability & Application

Pure Tung Oil is applied by wiping, brushing, or dipping. It requires thin, multiple coats for optimal penetration and curing. The oil must be spread evenly and excess wiped off after 15–30 minutes to prevent sticky buildup. Curing time between coats is 24–72 hours depending on temperature, humidity, and wood porosity. Full cure (hard film) takes 7–14 days. Do not apply in temperatures below 10°C or above 35°C. For faster curing, a small amount of Japan drier (cobalt/manganese catalyst) may be added, but this reduces the natural purity.

- Application method: Use a lint-free cloth or high-quality natural bristle brush. Avoid synthetic brushes that may swell.
- Thinning: If needed, thin with pure citrus solvent (d-limonene) or mineral spirits at a ratio not exceeding 10% by volume.
- Coating thickness: Apply in very thin layers (wet film thickness 0.05–0.1 mm). Thicker coats will not cure properly.
- Drying conditions: Ideal at 20–25°C and 40–60% relative humidity. Avoid dusty environments during curing.
- Sanding between coats: Lightly sand with 320–400 grit sandpaper after each coat has cured to ensure adhesion.
- Number of coats: Typically 3–5 coats for furniture, 5–7 for high-use surfaces like countertops.

4.0 Common Defects & Quality Control

- Reject if oil has a rancid or sour odor, indicating oxidation or contamination during storage.
- Reject if oil appears cloudy or contains visible sediment (unless sediment is natural and settles upon standing – acceptable if clear after gentle warming).
- Reject if viscosity exceeds 400 cP at 25°C, indicating polymerization or thickening beyond usable range.

- Reject if the oil fails to cure within 96 hours under standard conditions (20°C, 50% RH), indicating adulteration or expired catalyst.
- Reject if the cured film shows excessive tackiness or remains soft after 14 days.
- Reject if the oil contains any visible water separation or emulsion (water content >0.5% by Karl Fischer titration).
- Accept if the oil is clear, amber-colored, with a mild nutty odor, and passes the iodine value test within specification.

5.0 Storage, Handling & WHMIS Guidelines

- Store in a cool, dry area away from direct sunlight and heat sources. Ideal temperature: 10–25°C.
- Keep containers tightly sealed when not in use to prevent oxidation and moisture ingress.
- Shelf life: 2 years from manufacture date. Use FIFO (First In, First Out) inventory rotation.
- WHMIS Classification: Not classified as a hazardous product under WHMIS 2015 (GHS) when pure. However, oil-soaked rags pose a spontaneous combustion hazard.
- Critical safety: Dispose of oil-soaked rags in a sealed metal container filled with water, or spread them flat to dry outdoors away from structures before disposal. Never pile wet rags indoors.
- PPE: Use nitrile gloves to avoid skin contact (may cause mild irritation). Safety glasses recommended during application to prevent splashes.
- Ventilation: Use in well-ventilated areas. Although VOC content is low, prolonged inhalation of mist or vapors should be avoided.
- Spill management: Absorb with inert material (sand, vermiculite) and dispose as non-hazardous waste per local regulations.

Regulatory Disclaimer: This document is a generic technical material specification provided for educational purposes. The end-user assumes all liability for reviewing, adapting, and validating all tolerances, properties, and safety protocols against specific OEM data sheets and local regulations before deployment.