

Post Catalyzed Conversion Varnish Technical Material Specification

1.0 Material Overview & Common Uses

Post catalyzed conversion varnish is a two-component, high-performance wood coating system consisting of a base resin (typically alkyd-amino or polyester) and a separate acid catalyst (usually p-toluenesulfonic acid). The catalyst is added just before application, initiating a chemical crosslinking reaction that produces a durable, solvent-resistant, and mar-resistant finish. This material is distinct from pre-catalyzed lacquers, offering superior hardness and chemical resistance.

Common industrial applications include high-end kitchen cabinetry, commercial millwork, laboratory furniture, school and hospital casework, and any wood surface requiring a tough, clear or pigmented finish that withstands frequent cleaning and moderate abrasion. It is widely specified in architectural woodwork and custom furniture manufacturing where durability and appearance are critical.

2.0 Core Technical Properties & Sizing

- Viscosity (at 25°C, mixed): 25-35 seconds in a #2 Zahn cup, or 100-150 cP (Brookfield LVT, spindle #2 at 60 rpm).
- Non-volatile solids content: 38-42% by weight (as supplied, before catalyst addition).
- Catalyst addition rate: 5-10% by weight of base resin, as specified by manufacturer; typical ratio is 1 part catalyst to 10-15 parts varnish.
- Pot life (mixed): 4-8 hours at 20°C, decreasing to 2-3 hours at 30°C; discard after pot life expires.
- Density (mixed): 1.05-1.15 g/cm³ at 25°C.
- Flash point: 23-30°C (closed cup) for base resin; catalyst flash point typically >60°C.
- VOC content: 350-450 g/L (as applied, depending on formulation and reduction).
- Standard packaging: 4L, 20L, and 200L drums; catalyst supplied in 0.5L, 1L, and 4L containers.
- Shelf life (unmixed, unopened): 12 months from date of manufacture when stored below 25°C.

3.0 Processing, Machinability & Application

Post catalyzed conversion varnish is applied by conventional or air-assisted airless spray, HVLP spray, or curtain coating. It is not suitable for brush or roller application due to rapid solvent evaporation and short pot life. The material must be mixed thoroughly with the acid catalyst immediately before use, using a clean, non-reactive container (stainless steel or polyethylene). Agitate gently to avoid air entrapment.

- Substrate preparation: Sand wood to 180-220 grit; ensure surface is clean, dry, and free of dust, oil, and silicone. For MDF or particleboard, seal with a compatible sanding sealer first.
- Reduction: Thin with manufacturer-recommended reducer (typically 10-20% by volume) to achieve spray viscosity; do not use water, mineral spirits, or lacquer thinner unless specified.
- Spray parameters: Fluid pressure 10-15 psi (HVLP), atomization air 25-35 psi; fan pattern adjusted for even coverage. Apply 2-3 wet coats at 4-6 mils wet film thickness per coat.
- Flash-off time: 10-15 minutes between coats at 20°C and 50% relative humidity; extend if humidity is high.
- Cure schedule: Tack-free in 30-60 minutes; sandable in 2-4 hours; full chemical and mar resistance achieved after 7 days at 20°C. Forced cure at 50-60°C for 30-60 minutes reduces full cure to 24 hours.

- Sanding between coats: Use 320-400 grit stearated sandpaper; remove all sanding dust with a tack cloth before next coat.
- Cleanup: Immediately after use, clean spray equipment with manufacturer-recommended thinner or acetone; cured varnish is resistant to solvents and must be mechanically removed.

4.0 Common Defects & Quality Control

- Reject if catalyst is not uniformly mixed, causing soft spots or incomplete cure (test with MEK rub test: 100 double rubs with no softening).
- Reject if finish exhibits orange peel, blushing, or pinholes exceeding 0.5 mm diameter in any 10 cm² area.
- Reject if film thickness is below 2 mils (50 microns) dry film thickness after final cure, measured with a dry film thickness gauge.
- Reject if adhesion fails crosshatch tape test (ASTM D3359, method B) with any removal greater than 5%.
- Reject if gloss uniformity varies by more than 5 gloss units at 60° across a single panel (ASTM D523).
- Reject if there is visible cratering, fisheyes, or contamination from silicone or oil in the finish.
- Reject if pot life has been exceeded (material gelled or thickened beyond use) — do not attempt to thin or reactivate.
- Reject if the finish exhibits a milky or hazy appearance (blush) due to high humidity or rapid solvent evaporation.

5.0 Storage, Handling & WHMIS Guidelines

- Store base resin and catalyst separately in a cool, dry, well-ventilated area, away from heat sources, sparks, and open flames. Temperature range: 10-25°C. Do not store above 30°C.
- Keep containers tightly sealed when not in use to prevent solvent evaporation and moisture ingress. Use FIFO inventory rotation; do not use material beyond its shelf life.
- WHMIS classification: Base resin — Class B2 (Flammable Liquid), Class D2A (Respiratory sensitizer, may cause allergic reaction). Catalyst — Class E (Corrosive), Class D1B (Toxic if swallowed).
- Hazard statements: H226 (Flammable liquid and vapor), H317 (May cause allergic skin reaction), H335 (May cause respiratory irritation), H318 (Causes serious eye damage) for catalyst.
- Precautionary statements: P210 (Keep away from heat/sparks/open flames), P261 (Avoid breathing vapors/spray mist), P280 (Wear protective gloves/eye protection), P305+P351+P338 (IF IN EYES: Rinse cautiously with water for several minutes; remove contact lenses if present).
- Mandatory PPE: Safety glasses or face shield, nitrile or neoprene gloves, chemical-resistant apron, and NIOSH-approved organic vapor respirator (cartridge type OV) during mixing and spraying. Ensure adequate ventilation (explosion-proof).
- Spill procedure: Eliminate all ignition sources. Contain spill with inert absorbent (vermiculite, sand). Collect in sealed containers for disposal per local regulations. Do not flush to drains.
- Disposal: Do not dispose of uncured material in regular trash. Cure small quantities by spreading thinly in a well-ventilated area, then dispose of solid waste as non-hazardous. Follow provincial regulations for hazardous waste.

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