KATILAC COATINGS INC.

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PHF Series PINNACLE™ HAPs Free Conversion Varnish

PHF Series PINNACLE™ is a solvent borne, water white, HAPS-free, two component, alkyd/amino resin based conversion varnish. It is a yellowing resistant, high clarity topcoat with outstanding chemical, moisture and abrasion resistance. It features exceptional application properties, ultra-low formaldehyde release and excellent hardness.

It can be used in a self-sealing system or in conjunction with CS-10 Clear Seal or EK8 Vinyl Sealer (EK8 must be catalyzed).

SUGGESTED APPLICATIONS:

- cabinets
- household furniture
- interior trim and millwork
- office furniture
- kitchen and bath components
- high demand furniture

KEY PERFORMANCE FEATURES

- non-yellowing finish with added UV substrate protection*
- excellent hardness
- outstanding mar and scratch resistance
- ultra-low formaldehyde
- outstanding chemical and moisture resistance
- excellent flow and levelling
- conforms to KCMA & AWI/TR-4 & AWMAC System #5 Conversion Varnish Standards

RELATED PRODUCTS

EK 8 Vinyl Sealer (catalyzed)
CS 10 Post-Cat Sanding Sealer
B7406 Rich Wiping Stain
B7645 Classic Spray Stain

*UV inhibitors are self-sacrificing additives that protect wood for a finite amount of time that depends on the amount of UV exposure.

PHYSICAL PROPERTIES

Available Sheens	0,15,25,40,90
Weight Solids	52% ± 2
Volume Solids	44% ± 2
Viscosity	30 to 40" @ 25°C Ford 4
Specific Gravity	1.36 +/- 0.01 gms/cc @ 25°C
VOC	482 g/l
Typical coverage	10-12 m^2 / ltr @ 1 mil dry

ADDITIONAL CHARACTERISTICS

Catalyzation:	10% by volume of 1CAT catalyst
Pot-Life:	10-12 hrs at room temp.
Reduction:	10% by volume T4409 Lacquer Thinner; for faster cure T4424
Retarder:	n/a
Clean-up:	T4420 215 Gun Wash Universal
Shelf-life:	1 year from date of manufacture

Dry Times
26°C (~78°F) 50% RH

To Touch	10 minutes
To Sand	30-60 minutes
To Stack/Pack	18-24 hours

Note: Drying times will decrease at higher temperatures/lower humidity and will increase at lower temperatures/high humidity

COATING PREPARATION - Ensure product is stirred well and brought to room temperature before use. Product may be sprayed by conventional, airless and air-assisted airless spray. Add 10% 1CAT Catalyst by volume to unreduced product slowly under agitation. Add up to 10% T4409 Lacquer Thinner to product, agitate. Pot life is 10-12 hours at room temperature.

SURFACE PREPARATION - Wood surface should be clean, dry and free from any oil or grease. Moisture content of the wood should be 7-9%. Stains, color coats, glazes etc. should be applied according to manufacturer's directions and should be dry prior to application of sealer or topcoat. All color systems should be evaluated for color fastness and top coat adhesion prior to application. For best results use Katilac Brand stains, toners and colorant systems. Contact a Katilac Tech Service Representative for specific color coat recommendations.

APPLICATION - This product is designed to be applied at ambient conditions of 12° to 32° degrees Celsius (55° to 90° F). Millennium HFV can be used self-sealing or in conjunction with CS 10 or EK 8 (catalyzed) Sealers.
Apply in full uniform coats ideally at a rate of 3 to 5 wet mils. Total dry film thickness of coating system (sealer & top coat) should not exceed 4 mils.

Coating should be thoroughly dried and sanded smooth between coats. Sand with 240 to 320 grit professional silicon carbide paper. It is recommended that the finished item be conditioned at room temperature for 24 hours prior to stacking/packing.

SAFETY – During application, always wear eye protection, gloves and appropriate work clothing to minimize contact. Use a respirator and safety glasses at all times when spraying. Explosion proof ventilation is required with special consideration for enclosed or confined areas. Use caution when handing flammable liquids and eliminate sources of ignition and uncovered containers from the work place. Vapours formed from this product may travel or be moved by air currents and ignited by pilot lights, light switches, other flames, smoking, sparks, heaters, electrical equipment, static discharges or other ignition sources at locations distant from the product.

DISPOSAL - Disposal of chemicals and their solutions should be done according to local, provincial and federal regulations. Product Material Safety Data Sheets are available and should be consulted when handling products. These products are for Industrial and professional use only; Application directions must be followed.

PHF Series PINNACLE™ HAPs Free Conversion Varnish (cont'd)

PERFORMANCE TESTING / FILM CHARACTERISTICS
All performance testing is based on a composite of ASTM, AWI, ANSI and KCMA Standards

Household Chemical Resistance (ASTM D1308)
- test samples consist of 1 mil dry film on glass
- aged 7 days at room temperature prior to testing
- testing was performed by placing 1 milliliter of reagent on the surface of the dry film, under a watch glass for time as noted

Distilled Water (D1308. 6.1.1)	24 hrs	No effect
Ethyl Alcohol (D1308.6.1.3)	24 hrs	No effect
Coffee @ 180F (D1308.6.1.13)	24 hrs	No effect
Vinegar (D1308.6.1.4)	24 hrs	No effect
Mustard (D1308.6.1.12)	2 hrs	Slight discolouration – recovers @ 24hrs
Vegetable Oil (D1308.6.1.11)	24 hrs	No effect
Dish Detergent (D1308.6.1.8)	24 hrs	No effect

Note: A complete list of resistance tests with industrial and household chemicals can be found under ADDITIONAL STAIN TESTS

Hot Print Resistance (ASTM D 2091-96)
- test samples consisted of 1 mil dry film aged for 24 hours at room temperature prior to print testing
- duck cloth under a weight of 4 psi was then placed on dry film surface for a defined temperature/time

72F (18 hrs) 4 psi…pass
120F (1 hr) 4 psi…..pass
140F (1 hr) 4 psi…..pass

Hot/Cold Cycling Test (ASTM D 1211-97)
- test samples were coated on red oak at 4 mils dry and aged 21 days at room temperature prior to testing.
- one cycle consisted of:
  - 120F / 70% RH for 1 hour room temperature for 1 hour
  - -5F for 1 hour
- specimens examined for discolouration, blistering, cold cracking and film failure

No signs of failure at 10 cycles

Flammability Testing (ASTM E 84- 08a) Surface Burn Rating
- test samples consisted of fiberglass reinforced cement board coated with 4 mils dry of PHF-series
- samples were aged for 21 days at room temperature prior to testing

Flame Spread Index……5.0 Class 1 / Class A
Smoke Development……...5.0 Class 1 / Class A

KCMA Testing (ANSI/KCMA A161.1.1.2000)
Test samples consist of solid red oak coated at 4 mils dry and aged for 21 days at room temperature

A. Chemical Testing
- Vertical position for 24 hrs, water washed, dried, examined

Vinegar	Pass	Lemon Juice	Pass
Orange Juice	Pass	Grape Juice	Pass
Ketchup	Pass	Coffee	Pass
Olive Oil	Pass	100 proof alcohol	Pass
Mustard	Pass		

B. Detergent & Water Resistance Test
- Test panel edge immersed in KCMA detergent solution 24hrs
- Removed, dried and examined
  PASS – no signs of blistering, whitening, delamination, swelling

C. Heat Resistance Test
- Test panel placed in test chamber @ 120F/70% RH for 24hrs
  PASS – no signs of discolouration, whitening, delamination or swelling

D. Hot/Cold Cycle Test
- One cycle consists of 1 hr @ 120F / 30 min room temp / 1 hr -5F
  PASS – 10 cycles with no signs of discolouration, blistering, cold checking or any film failure

Additional Stain Tests
Testing conducted according to AWI, ASTM & KCMA Standards
- test samples consist of 1 mil dry film on glass
- aged for 21 days at room temperature
- testing was performed by placing 1 milliliter of reagent on the surface of the dry film, under a watch glass for time as noted

Ketchup	24 hrs	5	Windex	24 hrs	5
Palmolive Sol.	16 hrs	5	Mustard	1 hr	5
50% Ethanol	24 hrs	5	Acetone	1 hr	5
4% NaOH	1 hrs	5	Water	24 hrs	5
Olive Oil	24 hrs	5	Boiling Water	16 hrs	5
Tomato Juice	16 hrs	5	Motor Oil	16 hrs	5
2% Ammonia	24 hrs	5	Grease/Oil	16 hrs	5
Nail Polish Rem.	1 hr	5	Lighter Fluid	16 hrs	5
Lemon Juice	24 hrs	5	Vinegar	24 hrs	5
Red Wine	24 hrs	5	1% Tide Sol.	16 hrs	5
Coffee @ 180°F	24 hrs	5			

Rating: 1-poor 2-fair 3-good 4-very good 5-excellent

AWMAC / AWI (NAAWS Performance Standards Testing)
System # 5 Conversion Varnish (Clear):
- Standard Score - 129/135
- PHF Series score - 131/135

DISPOSAL - Disposal of chemicals and their solutions should be done according to local, provincial and federal regulations. Product Material Safety Data Sheets are available and should be consulted when handling products. These products are for Industrial and professional use only; Application directions must be followed.

WARRANTY – Katilac Coatings Inc. warrants that its products are free from defects in manufacture for a period of one (1) year from date of purchase, if used prior to expiration date and applied and used in accordance with Katilac Coatings' most current published specifications applicable to such products. Katilac Coatings Inc. expressly disclaims all other warranties, express or implied, including the implied warranties of merchantability and fitness for purpose. Katilac Coatings Inc. disclaims all liability for incidental, consequential or indirect damages of any nature whatsoever. This warranty cannot be changed or modified whether by course of dealing, custom or trade or otherwise, unless agreed to in writing by Katilac Coatings Inc.

Ver4/18 Supersedes all previous versions.