

Crestwood's 5-Star Evolution Finish

2 Part Italian Polyurethane Coating

The single-component polyurethanes sold to DIY in consumer stores here in America are nothing like the Italian high-performance two-component polyurethanes sold to industrial wood manufacturers. The DIY polyurethanes are typically higher viscosity and formulated to be applied by brush or mop. Italian industrial wood polyurethanes are catalyzed, two-component (2K) systems in which the polyurethane resins chemically cross-link with each other to form very strong bonds. As such, 2K or catalyzed polyurethanes dry much faster and are more resistant to chemical and moisture attack than the DIY urethanes.

- **Superior mar, water, solvent and household chemical resistance**
- **Formaldehyde-free**
- **Low in HAP's and VOCs**
- **Meets or exceeds all KCMA performance standards**
- **More flexible to show less cracking from wood expansion and contraction**

Both formaldehyde, contained in most catalyzed finishes, and isocyanates, contained in 2K polyurethanes, are toxic substances. But formaldehyde is emitted from the finish for a considerable time after application, while isocyanates become totally reacted with the rest of the finish very quickly.

Crestwood is one of the only manufacturers in the United States to use 2-K polyurethane. Most manufacturers still use catalyzed finishes and though they have been working hard to reduce and even eliminate (in some cases) the formaldehyde in their catalyzed finishes, most of these finishes still contain some formaldehyde.

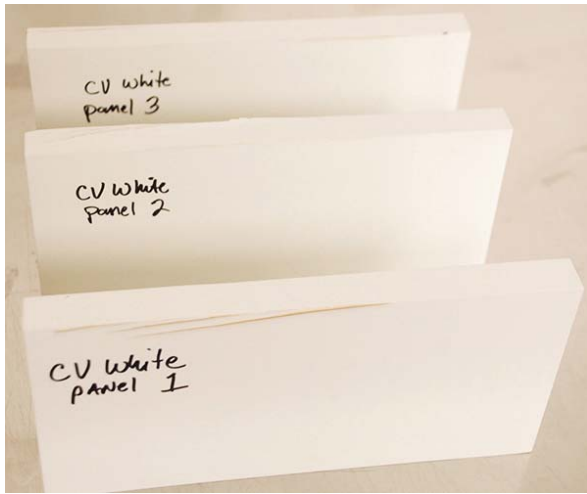


Two-part polyurethane is even more durable than conversion varnish. According to the Architectural Woodwork Institute, it is more wear, heat, solvent, moisture and stain resistant.

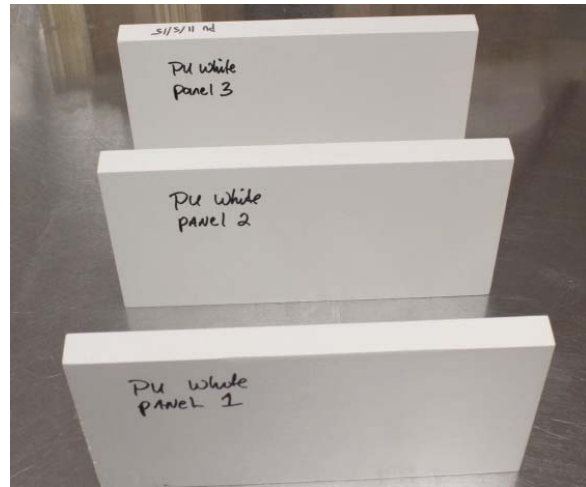
In Europe, 2K polyurethane is very popular. In fact, catalyzed finishes such as conversion varnish have been almost totally replaced by two-part polyurethane.

Crestwood's 5-Star Evolution Finish

KCMA edge soak results:



Conversion Varnish



Crestwood's 5-Star Evolution Finish

KCMA water immersion results:

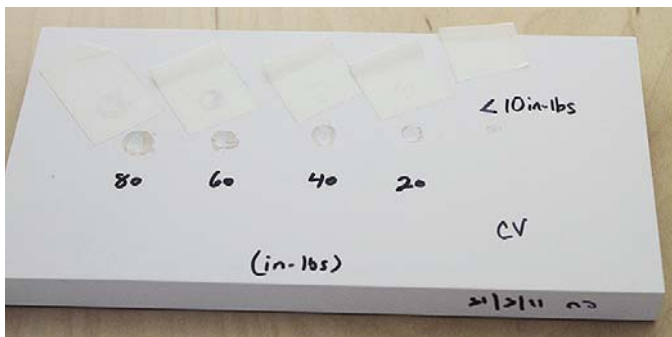


Conversion Varnish

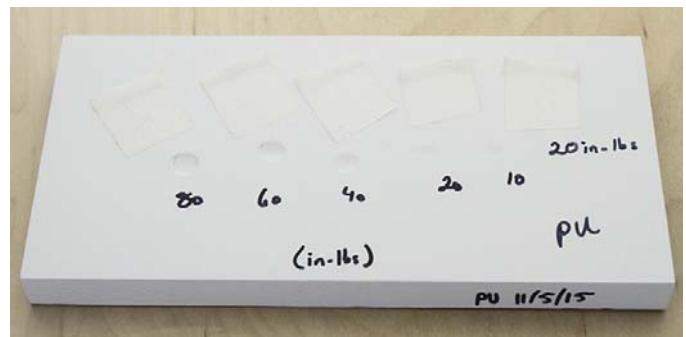


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KCMA impact results:



Conversion Varnish



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KCMA chemical resistance results:

ASTM D1308-87/AWI Chemical Resistance Testing					
Conversion Varnish System					
Number	Reagent	Test	16hr	1hr	15min
1	Catsup	ASTM	STAIN	PASS	
2	Vinegar 3%	ASTM	PASS		
3	Ethanol 50%	ASTM	PASS		
4	Olive Oil (veg oil)	ASTM	PASS		
5	2% Ammonia (caustic)	AWI	GLOSS LOSS	GLOSS LOSS	PASS
6	Lemon Juice (acid solution)	ASTM	PASS		
7	Coffee - Hot	ASTM/AWI	STAIN	STAIN	STAIN
8	Mustard - Griffen & French's	ASTM/AWI	STAIN	STAIN	STAIN
9	Water - Cold	ASTM	PASS		
10	Water - Hot	ASTM	PASS		
11	Motor Oil	ASTM/AWI	PASS		
12	Lighter Fluid	ASTM	PASS		
13	Palmolive Solution - 1% (soap soln)	ASTM	PASS		
14	Tide Solution - 1% (detergent soln)	ASTM/AWI	PASS		
15	4% Sodium Hydroxide (alkali solution)	ASTM	GLOSS LOSS	GLOSS LOSS	PASS
16	Lime Wedge	ASTM	PASS		
17	10% Sodium Hydroxide	AWI	GLOSS LOSS	GLOSS LOSS	PASS
18	28% Ammonia via NH3OH	AWI	GLOSS LOSS	PASS	
19	10% Sodium Phosphate	AWI	DAMAGE	PASS	
20	95% Ethanol	AWI	GLOSS LOSS	GLOSS LOSS	GLOSS LOSS
21	Tomato Juice	AWI	STAIN	PASS	
22	50% Sulfuric Acid	AWI	DAMAGE	GLOSS LOSS	GLOSS LOSS
23	Nail Polish Remover	AWI	GLOSS LOSS	GLOSS LOSS	GLOSS LOSS
24	Glacial Acetic Acid	AWI	STAIN	GLOSS LOSS	GLOSS LOSS
25	Orange Juice	AWI	PASS		

Note: All solutions are used at 1ml volumes in both covered & uncovered.

ASTM D1308-87/AWI Chemical Resistance Testing					
Crestwood's 5-Star Evolution Finish					
Number	Reagent	Test	16hr	1hr	15min
1	Catsup	ASTM	PASS		
2	Vinegar 3%	ASTM	PASS		
3	Ethanol 50%	ASTM	PASS		
4	Olive Oil (veg oil)	ASTM	PASS		
5	2% Ammonia (caustic)	AWI	PASS		
6	Lemon Juice (acid solution)	ASTM	PASS		
7	Coffee - Hot	ASTM/AWI	PASS		
8	Mustard - Griffen & French's	ASTM/AWI	STAIN	STAIN	PASS
9	Water - Cold	ASTM	PASS		
10	Water - Hot	ASTM	PASS		
11	Motor Oil	ASTM/AWI	PASS		
12	Lighter Fluid	ASTM	PASS		
13	Palmolive Solution - 1% (soap soln)	ASTM	PASS		
14	Tide Solution - 1% (detergent soln)	ASTM/AWI	PASS		
15	4% Sodium Hydroxide (alkali soln)	ASTM	GLOSS LOSS	GLOSS LOSS	PASS
16	Lime Wedge	ASTM	PASS		
17	10% Sodium Hydroxide	AWI	GLOSS LOSS	PASS	
18	28% Ammonia via NH3OH	AWI	GLOSS LOSS	PASS	
19	10% Sodium Phosphate	AWI	PASS		
20	95% Ethanol	AWI	GLOSS LOSS	GLOSS LOSS	GLOSS LOSS
21	Tomato Juice	AWI	PASS		
22	50% Sulfuric Acid	AWI	GLOSS LOSS	PASS	
23	Nail Polish Remover	AWI	GLOSS LOSS	GLOSS LOSS	GLOSS LOSS
24	Glacial Acetic Acid	AWI	GLOSS LOSS	GLOSS LOSS	GLOSS LOSS
25	Orange Juice	AWI	PASS		

Note: All solutions are used at 1ml volumes in both covered & uncovered.

KCMA chemical resistance results:

Test	Conversion Varnish	Crestwoods 5-Star Evolution
KCMA Cold Checks, ASTM D1211	Passed 47 cold check cycles	Passed 47 cold check cycles
KCMA Edge Soak (24 hour test)	Failed (Less than 24 hours)	Passed (264 Plus hours)
ASTM D870 Water Immersion	Failed (Less than 24 hours)	Passed (96 Plus hours)
ASTM D4541, Pull Off Adhesion*	1085 psi, average of 3 readings	1776 psi, average of 3 readings
ASTM D3359, Cross Hatch Adhesion	4B (<5%) using method B	4B (<5%) using method B
ASTM D2794, Impact Resistance	<10 in-lbs.	Passed 40 in-lbs.
ASTM D4060, Taber Abrasion Resistance*	244 mg loss**	153 mg loss**
ASTM D4587, UV Resistance QUV Cabinet	After 411 hours exposure the change in gloss was 1.6° down and the change in color was a Delta E of 0.3	After 411 hours exposure the change in gloss was 0.06° up and the change in color was a Delta E of 0.63
ASTM D1308/AWI Chemical Resistance Testing	Results on page 3	Results on page 2
ASTM D5178 Mar Resistance*	Wood panels mars at 2.5 Kg	Wood panels mars at 2.0 Kg
ASTM D2197 Scrape Adhesion*	5.5 Kg Coating Failure	At 10 Kg there was no failure
*Independent Testing Lab Results		
**Lower number indicates better abrasion resistance		