

PERMALAC[®] CLEARCOAT

METAL • WOOD • STONE

Tougher than all outdoors!

Independent lab puts Permalac to the test.

Permalac EF and Permalac 2K were developed to provide a high level of protection for metal, wood or stone in exterior applications. Recently an independent lab subjected these two products to a series of tests to establish the endurance, reliability and resistance to the elements users could expect in the field. The lab started by coating small panels of steel and pine with a single layer of the respective Permalac product, which was then cured to a dry film of about 1.0 mils (25 microns) thickness. Pine was selected because the test results would clearly apply to less porous hardwoods such as oak.

Adhesion

Adhesion of all samples was measured by ASTM Standard 3359 and cross-cut test.

SURFACE	ADHESION	REMARKS
Permalac EF		
Steel	5B	Good/Passes
Pine	Good	Passes
Permalac 2K		
Steel	5B	Good/Passes
Pine	Good	Passes

Gloss at 20/60 degree

Micro TRI gloss from BYK Gardner was used for measuring gloss. Five replicates were taken and the average is reported as gloss.

SURFACE	GLOSS@20/60	REMARKS
Permalac EF		
Steel	35.8/78	Low Gloss
Pine	2.8/11.9	Low Gloss
Permalac 2K		
Steel	94.58/107.6	High Gloss
Pine	10.1/29.9	Average

Pencil Hardness

ASTM D3363 standards were followed to measure pencil hardness.

SURFACE	PENCIL HARDNESS	REMARKS
Permalac EF		
Steel	4B	Good
Pine	4B	Low
Permalac 2K		
Steel	H	Good
Pine	3B/4B	Low

Note: It is difficult to measure pencil hardness on soft surfaces such as untreated pine. During evaluation, the stylus leaves its impression on the wood from 2B onwards.

MEK Double Rubs (methyl ethyl ketone)

To determine the solvent resistance of the coating, MEK double rubs were performed using ASTM Standard D4752.

SURFACE	MEK DOUBLE RUBS	REMARKS
Permalac EF		
Steel (after 24 hours)	10	Acceptable
Pine (after 24 hours)	10	Acceptable
Permalac 2K		
Steel (after 24 hours)	37	Acceptable
Pine (after 24 hours)	37	Acceptable
Steel (after 7 days)	80	Good



Impact Test

The hardness, flexibility and adhesion of the coating was evaluated by forward and reverse impact using ASTM Standard D2794. Weight used was 4 lb.

SURFACE	IMPACT (FORWARD/REVERSE)	REMARKS
Permalac EF		
Steel	160/80	Low
Pine	22/	Low
Permalac 2K		
Steel	160/160	Good
Pine	26/	Good

Note: At 80 lbs, wood breaks. It is difficult to measure reverse impact due to the wood panel softness. While the reported values are low, they are similar to other commercial products used on pine wood panels.

Taber Abrasion

Taber Abrasion Testing determines a coating's resistance to rubbing, scraping or other forms of erosion. When testing is completed, haze variation or weight loss are measured.

Before testing, the haze or original weight of test specimen is measured. The test specimen is then placed on the abrasion tester and a 250, 500 or 1,000-gram load is placed on top of the abrader wheel before spinning for a specified number of revolutions. Different abrading wheels are specified. A haze measurement or final weight is then taken.

SURFACE	WEIGHT LOSS (MG) @ 300 CYCLES	REMARKS
Permalac EF		
Steel	11.8	Low
Pine	10.9	Low
Permalac 2K		
Steel	3.4	Average
Pine	2.9	Average

Flexibility Test (1/4 inch)

The flexibility of the coating was recorded with the mandrel bending test: ASTM Standard D522. The tests are considered as passed when no cracks are observed.

SURFACE	MANDREL BENDING TEST	REMARKS
Permalac EF		
Steel	Passed	Good
Pine	N/A	N/A
Permalac 2K		
Steel	Passed	Good
Pine	N/A	N/A

Corrosion

Corrosion resistance was tested on steel panels using the Q-Fog cyclic corrosion tester, which is made by Q-Panel Company. The test was conducted as per ASTM B117 with a salt (NaCl) concentration of 5%. Temperature in the cabinet was maintained at 35 degrees C.

SURFACE	ASTM CORROSION RATING AFTER			REMARKS
	100 HOURS	200 HOURS	300 HOURS	
Permalac EF				
Steel	6	5	3	10—No Rust 0—Rusted
Pine	N/A	N/A	N/A	N/A
Permalac 2K				
Steel	8	6	5	10—No Rust 0—Rusted
Pine	N/A	N/A	N/A	N/A

