

# PERMALAC®

*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 or wood 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 were measured by ASTM Standard 3359 and cross cut test.

SURFACE	ADHESION	REMARKS
<b>Permalac EF</b>		
Steel	5B	Good/Passes
Pine	Good	Passes
<b>Permalac 2K</b>		
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
<b>Permalac EF</b>			
Steel	35.8/78	Low Gloss	
Pine	2.8/11.9	Low Gloss	
<b>Permalac 2K</b>			
Steel	94.58/107.6	High Gloss	
Pine	10.1/29.9	Average	

### Pencil Hardness

ASTM D 3363 standards were followed to measure pencil hardness.

SURFACE	PENCIL HARDNESS	REMARKS
<b>Permalac EF</b>		
Steel	4B	Good
Pine	4B	Low
<b>PERMALAC 2K</b>		
Steel	H	Good
Pine	3B Low	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
<b>Permalac EF</b>		
Steel (after 24 hours)	10	Acceptable
Pine (after 24 hours)	10	Acceptable
<b>Permalac 2K</b>		
Steel (after 24 hours)	37	Acceptable
Pine (after 24 hours)	37	Acceptable
Steel (after 24 hours)	80	Good



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Chattanooga | TN  
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p: 423-266-2712  
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## 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
<b>Permalac EF</b>		
Steel	160/80	Low
Pine	22/	Low
<b>Permalac 2K</b>		
Steel	160/160	Good
Pine	26/	Good

*Note:*At 80 lbs, wood breaks. It is difficult to measure reverse impact due 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, scapping 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 1000-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	WEIGH LOSS (MG) @ 300 CYCLES	REMARK
<b>Permalac EF</b>		
Steel	11.8	Low
Pine	10.9	Low
<b>Permalac 2K</b>		
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
<b>Permalac EF</b>		
Steel	Passed	Good
Pine	N/A	N/A
<b>Permalac 2K</b>		
Steel	Passed	Good
Pine	N/A	Corrosion

## 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 degree C.

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



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