

Water Repellency using API-WP30C

By: Advanced Polymer, Inc

A decorative graphic consisting of several horizontal lines of varying lengths and colors (red, white, and light blue) extending from the right side of the slide.

Materials & Testing Methods

Objective: Test and Compare the performance of API-WP30C water repellent (both as an additive and stand alone product) with the performance of retail water repellent products in use today.

Materials:

API-WP30 as Additive to:

- Solid Premium Stain without Water Repellent
- Semi- Transparent Stain without Water Repellent.

API-WP30 as stand alone product:

- API-WP 30 (as supplied)

-VS-

Retail Products Tested: (for result comparison)

- 8 Retail Water and Stain Repellent Products (purchased at a local Hardware Store)
- Consumer Products Tested are Labeled : Consumer Product A,B,C,D,E,F,G,H.

Product Testing Methods:

- ASTM D4446-Swellometer
- ASTM D5401-93 (Weight Test)

Testing Conditions for ASTM D4446-05 & ASTM 5401

- Prepare 5 pieces of wood specimen for every formulation tested including the untreated
- Immerse the wood specimen in the formulation for 3 minutes (water based) and 30 seconds (solvent based).
- Remove excess coating, if there is any using a foam brush.
- Allow to dry and cure for 72 hours
- Determine the quantity of water picked up and retained by the test specimen using the following data:
 - 1. Record weight of untreated specimen before water immersion
 - 2. Record weight of untreated specimen after water immersion
 - 3. Record the weight of treated masonry unit after 72 hours cure before water immersion
 - 4. Record the weight of treated masonry unit after water immersion

Testing Conditions Continued:

ASTM D4446-Swellometer :

Water Repellency: this test method is useful in determining the relative anti-swelling efficiency of various water-repellent formulations when applied to wood. It is the initial means of estimating the ability of water-repellent treated wood to perform satisfactorily when exposed to liquid water environments.. **The higher the score the better the water repellency.**

ASTM D5401-93 (Weight Test) :

Absorption: This test method is used to evaluate the effectiveness of water repellent coatings on wood soon after application or after long-term exterior exposure. Determines the amount of water absorbed by a substrate using a specific formula using the weight of the specimens prior to and after water emersion. **The higher the score the less water is absorbed into the substrate, and therefore better water repellency.**

Key :	
WRE	Water Repellency Effectiveness
PSS	Premium Solid Stain
STS	Semi-Transparent Stain

** Consumer Products labeled "Consumer Product A- Consumer Product I"









ASTM D 4446-05: Swellometer

Observations: Premium Solid Stain with API-WP30C as an additive, Semi-Transparent Stain with API-WP30C as an additive, and the API-WP30C as a stand alone product had **greater** water repellency than **all 8** consumer products tested.

Top Performers:

Product	WRE%
***PSS with API-WP30C	90.66
***STS with API-WP30C	61.63
***API-Wp30C (Stand Alone Product)	60.26
Consumer Product D	55.58
Consumer Product H	44.79
Consumer Product E	30.04
Consumer Product B	17.66
Consumer Product G	17.58
Consumer Product C	16.51
Consumer Product A	16.33
Consumer Product F	11.13







Water Beading:

	Consumer Product	Premium Solid with API-wp30C
initial		
After 1 hour		
After 2 hours		

ASTM D 5401: Weight

Observations: Premium Solid Stain with API-WP30C as an additive, and the API-WP30C as a stand alone product had **greater** water repellency than **all 8** consumer products tested. Semi-Transparent Stain with API-WP30C as an additive had greater water repellency than **6 out of 8** consumer products in use today.

Water Beading:

	Consumer Product	Premium Solid with API-wp30C
initial		
After 1 hour		
After 2 hours		

Top Performers:

Product	WRE%
***PSS with API-WP30C	87.91
***API-Wp30C (Stand Alone Product)	78.16
Consumer Product D	77.22
Consumer Product H	71.17
***STS with API-WP30C	66.22
Consumer Product E	59.78
Consumer Product F	51.12
Consumer Product A	47.89
Consumer Product G	47.49
Consumer Product C	35.60
Consumer Product B	26.95

Conclusion:

- API-WP30C provides greater water repellency than all of the consumer products tested with water repellent.
- It is available as an additive to either Acrylic Stain or Semi- Transparent Stain.
- It also produces great results as a stand alone water repellent.

Consumer Products

Average WRE%:

ASTM D 4446-05: **46.20%**

ASTM 5401: **26.20%**

WRE% Range:

ASTM D 4446-05 : **11.13 - 55.58%**

ASTM 5401: **26.95 - 77.22%**

API- WP30C

Average WRE%:

ASTM D 4446-05: **70.85%**

ASTM 5401: **77.43%**

WRE% Range:

ASTM D 4446-05: **60.26 - 90.66%**

ASTM 5401: **66.22 - 87.91%**

API-WP30C Technical Information

API-WP30C is a low VOC, hydrophobic, non-silicone waterborne emulsion specifically designed to impart water repellency and beading on wood. API-WP30C may also be applied to other architectural surfaces. API-WP 30C produces a clear finish. API-WP30C will impart pronounced and long lasting water beading not yet seen with other repellents, water-borne or solvent-borne.

TYPICAL PROPERTIES

Appearance: White Liquid

Solid Content: 40%

pH: 8.5

Specific Gravity (25°C): 1.00

Volatile Organic Content: <100g/L

CHARACTERISTICS

Protects Wood

Excellent “vehicle” for trans oxide dispersions commonly used in wood stains

Water Resistant Finish Prevents Water Staining/Wear

Non-yellowing... Assures Color Stability

Effective on Porous and Semi-Porous Building Materials May be

Formulated Into Surface Coatings/Finishes Allows substrate to

“Breathe”

RECOMMENDATIONS

The pH of prepared dilutions of API-WP30C should not drop below

7.0. If the pH of the dilution falls below 7.0, instability may occur. Add API-WP30C as the last component to the formulation; make sure that the pH of the system that API-WP30C is added to is greater than

7.0.

API-WP30C and formulations containing API-WP30C are sensitive to shear. High speed mixing, high pressure flow through a small nozzle or filter could cause a precipitate to form producing instability.

