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VANDERBILT

Minerals Laboratory Report

LABORATORY
REPORT
No. 3763-IR-1

VANSIL® WG Wollastonite in Texture Paint

INTRODUCTION

VANSIL WG and a competitive acicular wollastonite were tested in a series of interior texture paints. **VANSIL WG** was superior to the competitive acicular wollastonite in mud crack resistance.

DISCUSSION AND RESULTS

High build coatings, such as texture paints, contain mineral fillers for mud crack resistance and peak retention. Platy minerals, such as pyrophyllite or mica and acicular wollastonite are used for these properties. **VANSIL WG** and a competitive acicular wollastonite were tested in texture paint to assess their performance. The ratio of **PYRAX® WA** Pyrophyllite to acicular wollastonite was varied, while keeping the PVC constant at 80. These coatings are high solids and low binder content, with a pigment to binder ratio of 10 to 1. The low binder content and high solids contribute to the tendency of the coating to crack as it dries. Very minor changes in the formulation can have major effects on both mud cracking and peak retention. Higher solids improve peak retention but negatively impacts mud crack resistance. The presence of large platy or high aspect ratio acicular particles improves peak retention and mud crack resistance. Varying the ratio of pyrophyllite to wollastonite will also affect these properties.

The two acicular wollastonite products have similar properties as shown below.

	VANSIL® WG Wollastonite	Competitive Acicular Wollastonite
GE Brightness	88	85
+ 100 mesh	5	1
+ 200 mesh	20	15
Aspect Ratio	15:1	15:1
Oil Absorption	40	45

The texture paints were prepared according to the formulas given in the attached table. The paints are constituted as follows:

- 010303A: 3.9 gal **VANSIL WG** + 23.2 gal **PYRAX WA**.
- 010303B: 3.9 gal competitive acicular wollastonite + 23.2 gal **PYRAX WA**.
- 010303C: 7.1 gal **VANSIL WG** + 20.0 gal **PYRAX WA**.
- 010303D: 7.1 gal competitive acicular Wollastonite + 20.0 gal **PYRAX WA**.

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The following observations were made, with 010303A compared to 010303B and 010303C compared to 010303D (see attached photos):

Smoothed areas

010303A: no cracks
010303B: 1 small crack
010303C: no cracks
010303D: no cracks

Peaked areas:

010303A: a few small cracks, sharp peaks
010303B: several small cracks, sharp peaks
010303C: no cracks, very sharp peaks
010303D: a few small cracks, very sharp peaks

Dry film brightness and color:

010303A v 010303B: to the eye there is no apparent difference in brightness, but A is brighter than B, $\Delta E = 0.47$
010303C v 010303D: to the eye there is no apparent difference in brightness, but C is brighter than D, $\Delta E = 0.68$

(For white and near white materials, $\Delta E < 1$ is not perceptible to the eye.)

These tests indicate that for the interior texture paint studied, **VANSIL® WG** Wollastonite is superior to the competitive acicular wollastonite for mud crack resistance. The two products are equivalent for peaking and color effect.

EXPERIMENTAL

The texture paints were prepared according to the formulas given in the attached table. The paints were applied by spatula to plywood at 1-2 mm DFT in the smoothed area. The spatula was used to smooth approximately one half of the area and to form peaks on the other half. The texture paints were dried at ambient conditions then observations were made about mud cracking and peak retention. Dry brightness and L a b color were measured on samples of texture paint applied to glass (to ensure a smooth surface) using the Technidyne Micro S5-M Brightimeter®.

CONCLUSION

This study compared the performance of two competitive acicular wollastonite products with regard to mud crack resistance and peak retention. **VANSIL WG** is superior to the competitive acicular wollastonite in mud crack resistance, equivalent in peak retention, and yields a slightly brighter coating.



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Minerals Formula

Formula 010303
Interior Texture Paint
DARVAN® 7-N¹ Dispersant, PYRAX® WA¹ Pyrophyllite, VANZAN®¹ Xanthan Gum,
VANSIL® WG¹ Wollastonite

	<u>Pounds</u>	<u>Gallons</u>	<u>Kilograms</u>	<u>Liters</u>
DISPERSION				
Water	448.7	53.8	53.95	53.95
DARVAN 7-N¹ Dispersant	10.0	1.0	1.21	1.04
Triton® CF 10 ²	2.5	0.3	0.30	0.28
Nopco® NDW ³	4.0	0.5	0.48	0.53
<i>Preblend the next three items and add:</i>				
Ti-Pure® R 931 ⁴	61.5	1.8	7.42	2.06
PYRAX WA¹ Pyrophyllite	460.0	20.0	64.52	23.29
VANZAN¹ Xanthan Gum	10.0	1.5	1.21	0.80
<i>Mix at high speed for 20 minutes.</i>				
<i>Reduce speed for let down.</i>				
LET DOWN				
VANSIL WG¹ Wollastonite	170.0	7.1	11.46	3.95
Everflex® GT Latex ⁵	125.0	14.0	15.08	14.09
<i>Mix at slow speed for 5 minutes.</i>				
TOTALS	1291.7	100.0	155.63	99.99
PAINT PROPERTIES				
Density	12.9 lbs/gal		1.56 g/ml	
% Solids by weight	59.6			
% Solids by volume	37.4			
% PVC	80.5			
Pigment to binder ratio	10.5:1			
Calculated VOC	0 lbs/gal		0 g/l	

RAW MATERIAL SUPPLIERS

- ¹Vanderbilt Minerals, LLC, Norwalk, CT
- ²Dow Chemical Company, Midland, MI
- ³Henkel Corporation, Rocky Hill, CT
- ⁴E.I. du Pont de Nemours & Company, Wilmington, DE
- ⁵Owensboro Specialty Polymers, Owensboro, KY

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Interior Texture Paint Comparison VANSIL[®] WG v Competitive Acicular Wollastonite

VANSIL WG
010303 A



Competitive Acicular Wollastonite
010303 B



**VANSIL® WG
010303 C**



**Competitive Acicular Wollastonite
010303 D**

