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VANDERBILT

Laboratory Report

PAINT LAB REPORT No. 3797-1

TITLE: VanBrite™ 552 Mineral Slurry in Texture Paints

INTRODUCTION: VanBrite 552 is a water-based blend of smectite clay, calcite, dolomite and other minerals. This study examines its use as a coarse filler in water-based high build texture paint for trowel application.

DISCUSSION and RESULTS: Water-based high build texture paints for trowel application are high solids, high viscosity compositions that use coarse fillers for peak retention and mud crack resistance. **PYRAX® WA** Pyrophyllite, a platy mica-like mineral, gives good mud crack resistance. **VANSIL® WG** Wollastonite, an acicular mineral, gives good peak formation and good peak retention. Coarse calcite or dolomitic limestone are often used as fillers because of their brightness and low cost. Unfortunately, calcite and dolomitic limestone do not contribute to peak formation and retention or mud crack resistance. **VanBrite 552** is a 35% solids water-based blend of smectite clay, calcite, dolomite and other minerals. The smectite component will make up for some of the deficiencies of calcite or dolomitic limestone.

The basic formula for the texture paints is given below. **VanBrite 552** or dolomitic limestone was substituted for all or a portion of the **PYRAX WA**.

Formula 020411

Interior Texture Paint

DARVAN® 7-N¹ Dispersant, **PYRAX® WA¹** Pyrophyllite,
VANZAN®⁰¹ Xanthan Gum, **VANSIL® WG¹** Wollastonite

	<u>Pounds</u>	<u>Gallons</u>
DISPERSION		
Water	464.0	55.7
DARVAN® 7-N¹ Dispersant	10.0	1.0
Triton® CF-10 ²	2.5	0.3
Non-silicone Defoamer	4.0	0.5
<i>Preblend the next three items and add:</i>		
Ti-Pure® R 706 ³	60.0	2.0
PYRAX® WA¹ Pyrophyllite	450.0	19.5
VANZAN®⁰¹ Xanthan Gum	10.0	0.8
<i>Mix at medium speed for 10 minutes.</i>		
LET DOWN		
VANSIL® WG¹ Wollastonite	150.0	6.2
Everflex® GT ⁴	125.0	14.0
<i>Mix at slow speed for 5 minutes.</i>		
TOTALS	1275.5	100.0
PAINT PROPERTIES		
Weight per gallon	12.8	
% Solids (by weight)	57.9	
% Solids (by volume)	35.5	
PVC	79.8	
Pigment to binder ratio	9.59:1	
Calculated VOC	0 lb/gal, 0 g/L	

RAW MATERIAL SUPPLIERS:

¹ R.T. Vanderbilt Company, Inc., Norwalk, CT

² Dow Chemical Company, Midland, MI

³ E.I. du Pont de Nemours & Company, Wilmington, DE

⁴ Owensboro Specialty Polymers, Owensboro, KY

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The following examples show the effect of substituting **VanBrite™ 552** Mineral Slurry for a portion of the **PYRAX® WA** Pyrophyllite. The replacements were made on equal volume basis.

PYRAX® WA¹ Pyrophyllite and VanBrite™ 552 Mineral Slurry Tests

<u>Formula Number</u>	<u>Inert Fillers</u>	<u>Lbs per 100 gal (dry basis)</u>	<u>Ratio (dry basis)</u>
020411 B	PYRAX® WA Pyrophyllite	450.0	100
020411 C	Dolomitic Limestone	455.0	100
020411 D	PYRAX WA & Dolomitic Limestone	225.0 & 227.5	50/50
020411 G	VanBrite™ 552 Mineral Slurry & PYRAX WA	157.5 & 292.5	35/65
020411 H	VanBrite 552 & PYRAX WA (without VANZAN® Xanthan Gum)	157.5 & 292.5	35/65

Several tests were run, including peak formation, peak retention, mud crack resistance, viscosity, water retention, dry brightness, opacity, gloss, sag resistance and adhesion. The following observations were made. See Table 2 and the attached photos.

<u>Property</u>	<u>Formula</u>	<u>Rating</u>
Peak Retention	020411 G	Very good (very sharp peaks)
	020411 B, H	Good (sharp peaks)
	020411 C,D	Poor (no peaks)
Mud Crack Resistance	020411 C,D	Very good (no cracks)
	020411 B	Good (a few cracks)
	020411 G, H	Fair (several cracks)
Viscosity	020411 H	Best for troweling
	020411 B	Good for troweling
	020411 G	Fair, slightly high for troweling
	020411 C, D	Poor, too low for troweling
Brightness	020411 C	Best, highest brightness (84-85)
	020411 B,D	Good, medium brightness (83-84)
	020411 G, H	Fair, lowest brightness (79-80)
Water Retention	020411 B, G	Very good (no water separation)
	020411 C, D, H	Fair (slight water separation)
Opacity (4 mil cl)	020411 G	Best (0.98)
	020411 H	Good (0.95)
	020411 B, D	Fair (0.85-0.86)
	020411 C	Poor (0.79)
Sag Resistance	020411 B, D, G	Very good (no movement or sag)
	020411 C, H	Poor (significant movement and sag)
Adhesion	020411 B, D, G	Very good (no loss of adhesion)
	020411 C, H	Poor (no adhesion)

EXPERIMENTAL: The interior texture paint formulas were prepared according to the formulas given in Table 1. Peak formation, peak retention and mud crack resistance were tested as follows. A thick layer of texture paint was applied to a section of wall board. Peaks were formed with a spatula on approximately half the area; the other half was smoothed. The paints were air dried at ambient conditions and observed for the existence of peaks (or lack thereof), their sharpness and any cracking in either area. The sag resistance and adhesion test was run as follows. The texture paint was squeezed out in a line across a plain white card, then hung vertically to dry. The tendency of the line to move down the card and its overall adhesion were observed. Dry brightness was measured on 6 mil cl drawdowns made on plain white cards. Opacity was measured on 4 mil cl drawdowns on black-and-white cards. Viscosity was measured by Brookfield RVT at 10, 20, 50 and 100 rpm.

CONCLUSION: This study shows that **VanBrite™ 552** Mineral Slurry could be used as a filler for high build texture paints for trowel application. Good peak formation and peak retention were achieved when used at a 35/65 ratio with **PYRAX® WA** Pyrophyllite.

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Table 1

Formula 020411 Texture Paint

	020411 B PYRAX® WA Pyrophyllite		020411 C Dolocron® 45-12		020411 D 50/50 PYRAX WA & Dolocron 45-12		020411 G 35/65 VanBrite™ 552 Mineral Slurry & PYRAX WA		020411 H 35/65 VanBrite 552 & PYRAX WA	
	pounds	gallons	pounds	gallons	pounds	gallons	pounds	gallons	pounds	gallons
DISPERSION										
Water	464.0	55.7	464.0	55.7	464.0	55.7	163.5	19.6	170.1	20.4
DARVAN® 7-N ¹ Dispersant	10.0	1.0	10.0	1.0	10.0	1.0	10.0	1.0	10.0	1.0
Triton® CF-10 ²	2.5	0.3	2.5	0.3	2.5	0.3	2.5	0.3	2.5	0.3
Non-silicone defoamer	4.0	0.5	4.0	0.5	4.0	0.5	4.0	0.5	4.0	0.5
VanBrite 552 ¹	0.0	0.0	0.0	0.0	0.0	0.0	450.0	42.9	450.0	42.9
Ti-Pure® R 706 ³	60.0	2.0	60.0	2.0	60.0	2.0	60.0	2.0	60.0	2.0
Dolocron® 45-12 ⁴	0.0	0.0	455.0	19.5	227.5	9.8	0.0	0.0	0.0	0.0
PYRAX WA ¹	450.0	19.5	0.0	0.0	225.0	9.7	292.5	12.7	292.5	12.7
VANZAN® ¹ Xanthan Gum	10.0	0.8	10.0	0.8	10.0	0.8	10.0	0.8	0.0	0.0
<i>Mix at medium speed for 10 minutes. Reduce speed for let down.</i>										
LET DOWN										
VANSIL® WG ¹ Wollastonite	150.0	6.2	150.0	6.2	150.0	6.2	150.0	6.2	150.0	6.2
Everflex® GT Latex ⁵	125.0	14.0	125.0	14.0	125.0	14.0	125.0	14.0	125.0	14.0
<i>Mix at slow speed for 5 minutes.</i>										
Totals	1275.5	100.0	1280.5	100.0	1278.0	100.0	1267.5	100.0	1264.1	100.0
PAINT PROPERTIES										
Weight per gallon		12.8		12.8		12.8		12.7		12.6
% Solids	by weight	57.9		58.1		58.0		58.3		57.7
	by volume	35.5		35.5		35.5		36.4		35.6
PVC		79.8		79.8		79.8		80.3		80.3
Pigment to binder ratio		9.56:1		9.64:1		9.59:1		9.56:1		9.56:1
Calculated VOC	lbs/gal	0		0		0		0		0
	g/l	0		0		0		0		0

Table 2

Formula 020411 Texture Paint

		020411 B PYRAX® WA Pyrophyllite	020411 C Dolocron® 45-12	020411 D 50/50 PYRAX WA & Dolocron 45-12	020411 G 35/65 VanBrite™ 552 Mineral Slurry & PYRAX WA	020411 H 35/65 VanBrite 552 & PYRAX WA
Brookfield Viscosity	10 rpm	76 K	38 K	59 K	250 K	142 K
	20 rpm	40 K	21 K	31 K	159 K	60 K
	50 rpm	20 K	10 K	15 K	79 K	20 K
	100 rpm	12 K	5 K	8 K	> 40 K	12 K
	TI	6.33	7.60	7.38	6.25	11.8
GE Brightness		83.0	84.5	83.7	79.6	80.3
L		92.6	92.7	92.7	91.1	91.4
a		-0.3	-0.2	-0.2	-0.2	-0.2
b		2.3	1.4	1.9	3.0	2.9
ΔE vs 020411 B			0.91	0.42	1.66	1.35
Opacity	4 mil cl	0.846	0.787	0.860	0.979	0.947
Gloss	20°	1	1	1	1	1
	60°	2	2	2	2	2
	85°	<1	<1	<1	<1	<1
Sag & Adhesion		none good adhesion	very bad poor adhesion	none good adhesion	none good adhesion	very bad poor adhesion

Peaks & cracks

020411 B--Sharp peaks. Not quite as sharp as A. A few cracks in the peaked area. No cracks in the smoothed area.

020411 C--Lumpy. Very poor peaks. Almost all collapsed. No cracks in peaked or smoothed area.

020411 D--Poor peaks. Slightly better than C. No cracks in peaked or smoothed area.

020411 G--Very sharp peaks. Several cracks in the peaked area. Several cracks in the smoothed area.

020411 H--Sharp peaks. Not quite as good as A or G. Many cracks in the peaked area. A few cracks in the smoothed area.

Evidence of water separation around the coated area (stain on wall board).

RAW MATERIAL SUPPLIERS:

¹R.T. Vanderbilt Company, Inc., Norwalk, CT

²Dow Chemical Company, Midland, MI

³E.I. du Pont de Nemours & Company, Wilmington, DE

⁴Specialty Minerals, Inc., Barretts, MT

⁵Owensboro Specialty Polymers, Owensboro, KY

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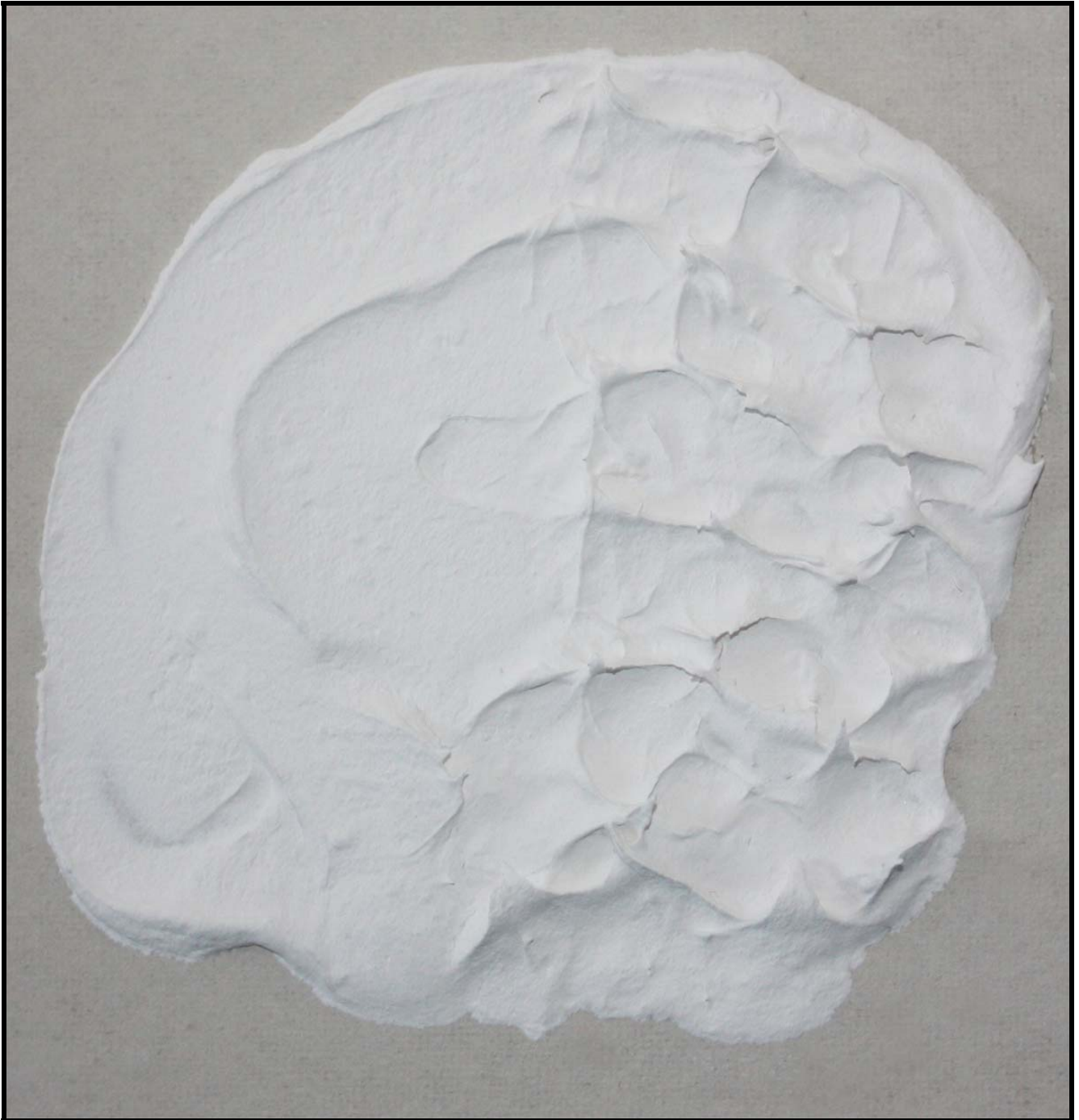
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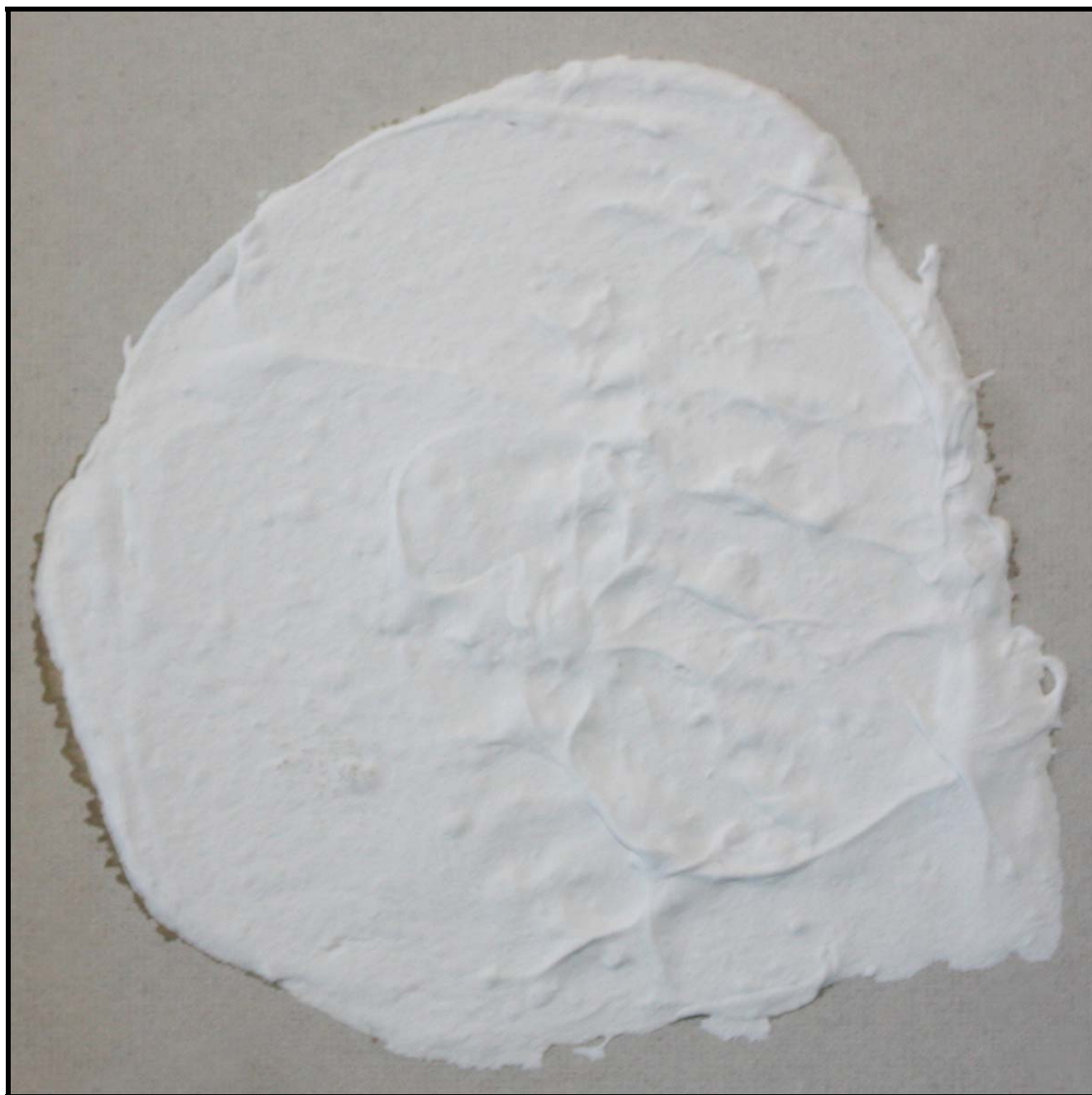
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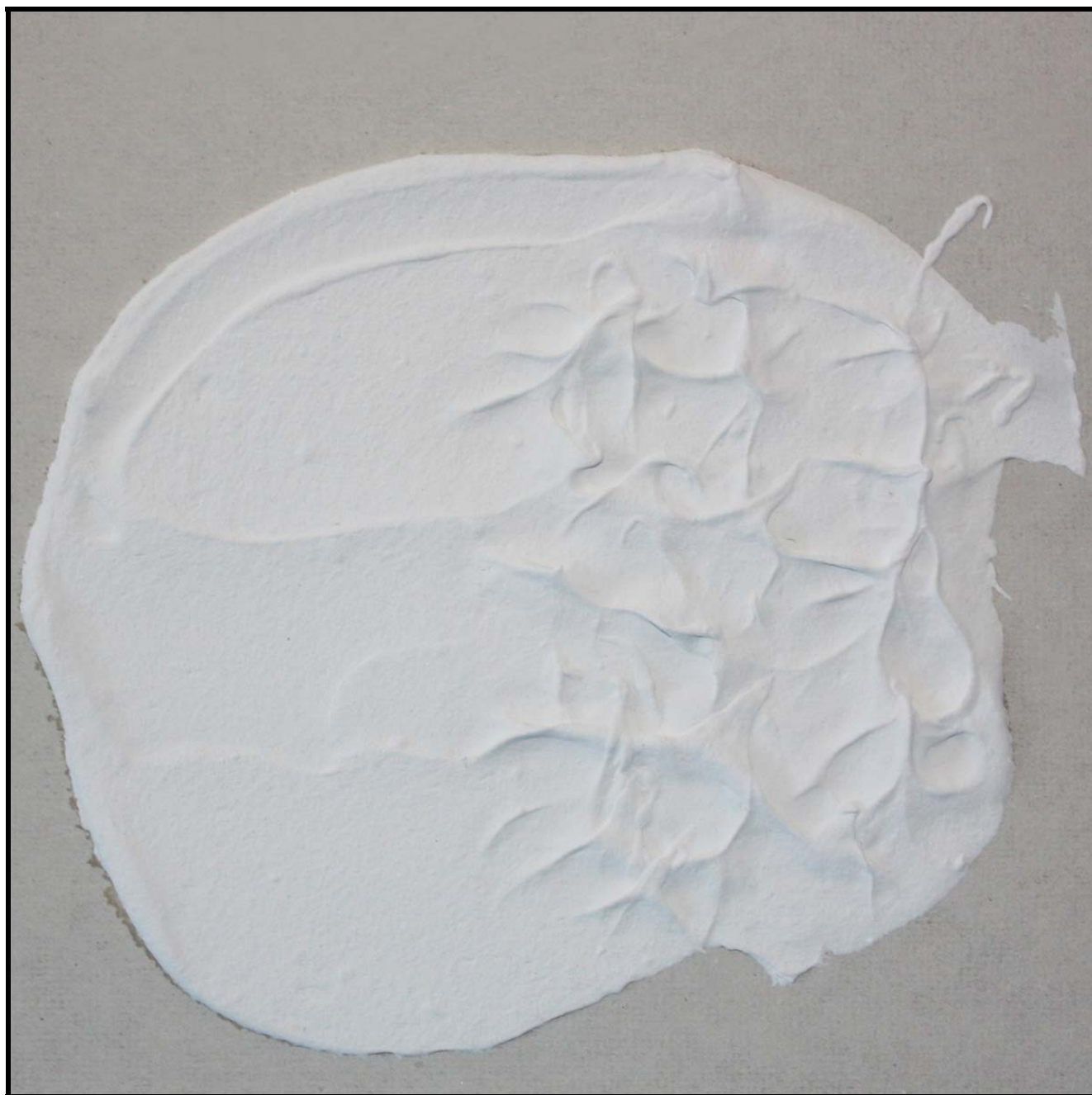
020411 B—PYRAX® WA Pyrophyllite



020411 C—Dolocron® 45-12



020411 D—50/50 **PYRAX® WA** Pyrophyllite & Dolocron® 45-12



020411 G—35/65 **VanBrite™ 552** Mineral Slurry & **PYRAX® WA** Pyrophyllite



020411 H—35/65 **VanBrite™ 552** Mineral Slurry & **PYRAX® WA** Pyrophyllite
(no **VANZAN®** Xanthan Gum)

