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NUOSPERSE® 9850
Dispersing Agent for Solventborne
Coatings and Colorants

Technical Report

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Comparison of NUOSPERSE[®] 9850 dispersing performance vs. Competitor for carbon black and organic pigments

Summary

NUOSPERSE[®] 9850 polymeric dispersing agent is highly effective for dispersing carbon black and most types of organic pigments. It is also suitable for inorganic pastes. It is recommended for use in a wide range of high-performance, solvent-borne coatings and is an effective dispersant for both paints and colorants.

This report presents formulation and test results which compare the paint color performance of the Elementis Specialties commercial pigment dispersant NUOSPERSE[®] 9850 versus a competitor dispersant.

1. Introduction

Traditionally formulated solvent borne colorants or other pigmented industrial coatings typically contain wetting and dispersing agents to aid in the deflocculation of the pigments. Older anion and non-ionic surfactants have given way to more advanced polymeric dispersants, which have further improved the stabilization of the pigments.

NUOSPERSE[®] 9850 showed excellent performance when compared to the industry standard polymeric dispersing agents.

Coating formulations based on NUOSPERSE[®] 9850 show the following properties:

- Rapid pigment wetting
- Increased mill output
- Maximum tinting strength and full chroma development
- Compatible with a broad range of coatings
- No floating, flooding or rub-out

2. Practical

The formula details for the black and organic pigment colorant bases using each dispersant are in the following tables. A total of four colorant bases were made.

2.1 Carbon Black

Material	Wt%
Raven 5000 ULTRA Powder II	10.00
Paraloid DM55 (60% in n ButAc)	33.40
Dispersant	8.00
n-ButAc	48.60
Total	100.00

* Grind on an attritor mill for 26 hours to a Hegman Grind of 7+

2.2 Organic Pigments

Material	Wt%
Organic Pigment	20.00
Paraloid DM55 (60% in n ButAc)	46.80
Dispersant	9.00
n-ButAc	24.20
Total	100.00

* Grind on an attritor mill for 26 hours to a Hegman Grind of 7+

The black pigmented colorant bases using the different dispersants were evaluated in the paint resin systems for color acceptance, color strength, gloss, Jetness, and flocculation by using the competitive dispersant as a reference. Organic pigment colorants were evaluated for color strength, color difference (ΔE), and gloss difference.

The following paint system was used to evaluate the performance of the 4 pigment dispersants:

- Acrylic-Urethane (2K)

3. Test results

3.1 Carbon Black

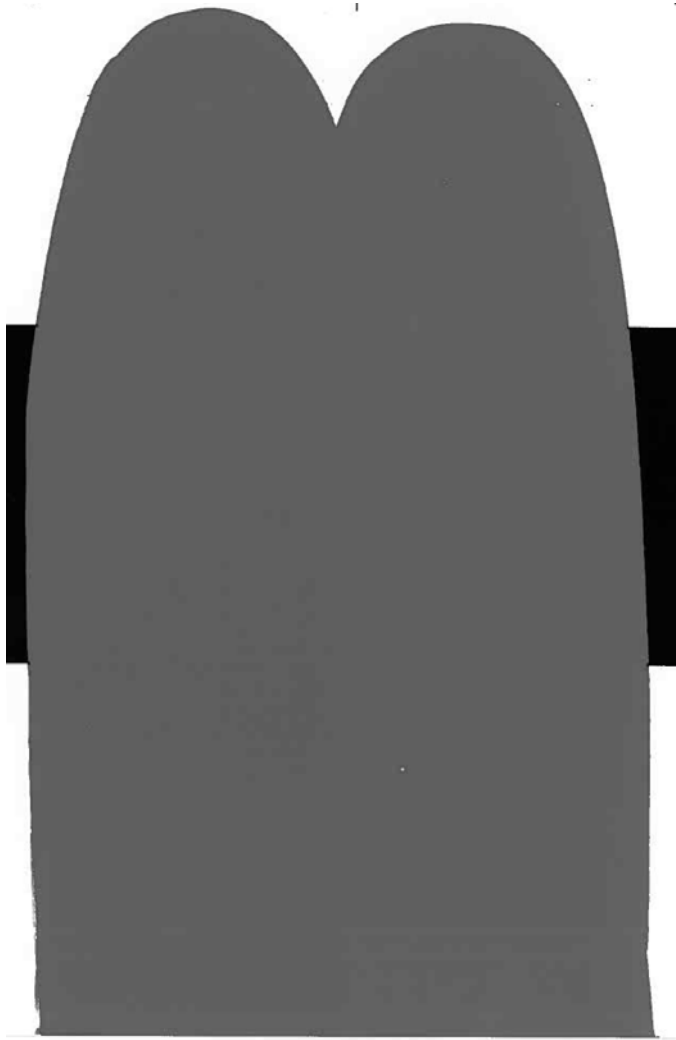
Following table shows results of color difference (ΔE), difference of gloss, color strength difference, and Jetness (ΔL) in an acrylic urethane paint. Values obtained are for NUOSPERSE[®] 9850 using competitor dispersant as the reference standard.

BLACK				
	Masstone		Tint (90:10)	
Results	Competitor (standard)	NUOSPERSE[®] 9850	Competitor (standard)	NUOSPERSE[®] 9850
Draw down, Visual (3 mil)	Good	Good	Good	Good
Rub Up	Good	Good	Good	Good
Gloss, 60°	76.20	82.80	89.50	90.10
L*	23.34	23.34	49.71	49.42
a*	0.31	0.28	-0.94	-0.96
b*	0.39	0.39	-2.33	-2.84
Color Difference (ΔE)		0.19		0.59
Color Strength		101.30		103.37
Jetness (ΔL)		0.00		

3.1.1 Carbon Black draw down (90:10 Tint)

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Competitor



3.2 Organic Pigments

Following tables shows results of color difference (ΔE), differences of gloss, and color strength in an acrylic urethane paint. Values obtained are for NUOSPERSE® 9850 using competitor dispersant as the reference standard.

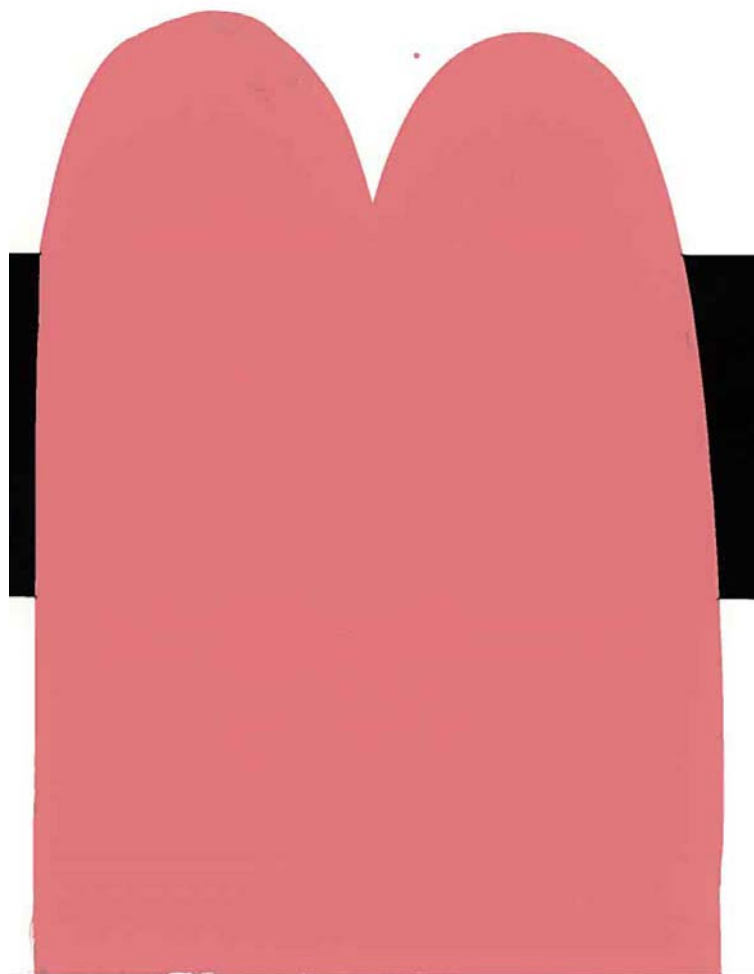
3.2.1 Pigment Red 3

RED				
	Masstone		Tint (90:10)	
Results	Competitor (standard)	NUOSPERSE® 9850	Competitor (standard)	NUOSPERSE® 9850
Draw down, Visual (3 mil)	Good	Good	Good	Good
Rub Up	Good	Good	Good	Good
Gloss, 60°	5.40	10.30	86.90	86.20
L*	39.58	39.52	63.00	62.81
a*	43.88	43.68	35.75	35.62
b*	26.50	26.50	10.45	10.58
Color Difference (ΔE)		0.37		0.26
Color Strength		102.39		100.86

3.2.1.1 Pigment Red Draw Down (90:10 Tint)

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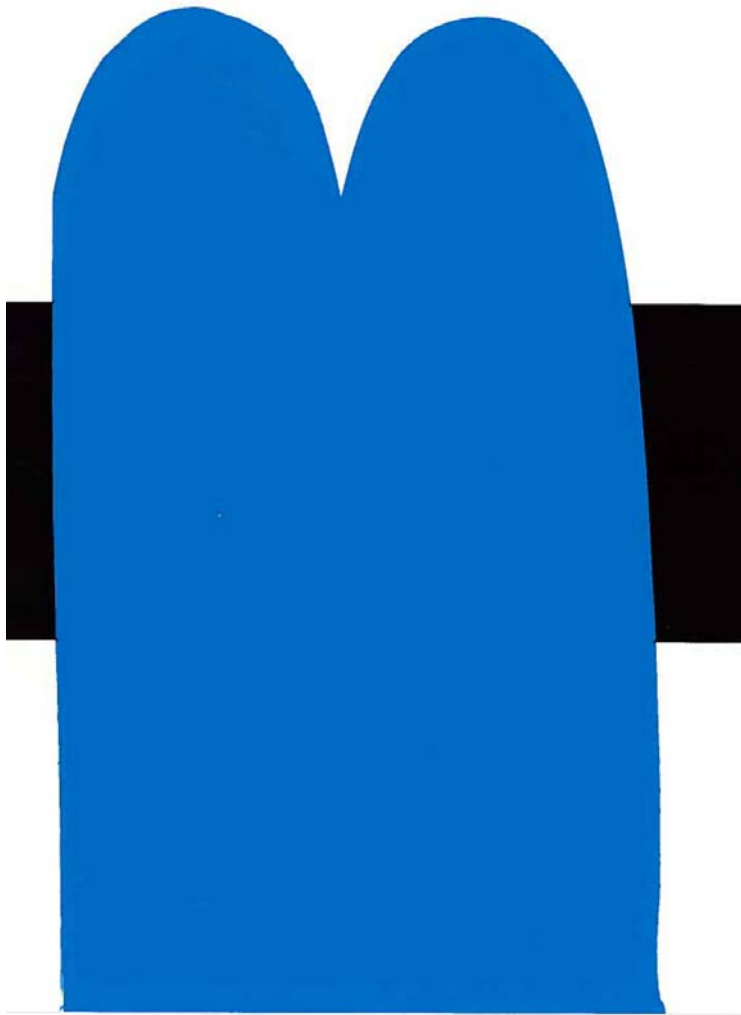


3.2.2 Pigment Blue 15:2

BLUE				
	Masstone		Tint (90:10)	
Results	Competitor (standard)	NUOSPERS[®] 9850	Competitor (standard)	NUOSPERS[®]E 9850
Draw down, Visual (3 mil)	Good	Good	Good	Good
Rub Up	Good	Good	Good	Good
Gloss, 60°	80.70	81.70	88.10	87.10
L*	22.73	22.73	53.68	53.52
a*	3.76	3.89	-14.78	-14.50
b*	-7.98	-8.16	-38.53	-38.16
Color Difference (ΔE)		0.22		0.49
Color Strength		100.92		100.68

3.2.2.1 Pigment Blue 15:2 Draw Down (90:10 Tint)

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3.2.3 Pigment Green 7

GREEN				
Results	Masstone		Tint (90:10)	
	Competitor (standard)	NUOSPERSE® 9850	Competitor (standard)	NUOSPERSE® 9850
Draw down, Visual (3 mil)	Good	Good	Good	Good
Rub Up	Good	Good	Good	Good
Gloss, 60°	75.30	78.40	86.20	87.80
L*	24.71	24.64	66.15	66.13
a*	-5.18	-5.14	-43.74	-43.75
b*	-3.14	-3.14	2.10	2.11
Color Difference (ΔE)		0.14		0.03
Color Strength		100.81		100.03

3.2.3.1 Pigment Green 7 Draw Down

NUOSPERSE® 9850 **Competitor**



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