

ENCOR® DT 211

FOR TRAFFIC PAINT APPLICATIONS



Product Benefits

ENCOR® DT 211 is a 100% acrylic fast dry latex binder for traffic markings applied at standard line thickness of typically 15 mils wet. This product features a patented fast drying technology that makes it ideal for formulations requiring rapid “no-tracking” and “dry-through” performance.

In addition, this latex often shows superior performance in water soak and water wash-off resistance testing vs. other competitive first generation fast dry latex binders. The outstanding wet adhesion and water resistance allow application under a wide range of climatic conditions without compromising performance.

Polymer Design

- 100% Acrylic Latex Polymer

Performance Benefits

- Superior wet adhesion and water resistance
- Good fast dry performance
- Compatibility with industry-standard formulations
- Outstanding retro-reflectivity and optical properties

Typical Polymer Properties¹

Appearance	White Liquid
Total Solids, % by weight	50.5
Weight per Gallon, lb	8.7
pH Value	10.5
Particle Size, µm	0.2
Viscosity, Brookfield, cP	300 max
Minimum Filming Temperature, °C	17
Glass Transition Temperature, °C	24

¹The data provided for these properties are typical values, intended only as guides, and should not be construed as sales specifications.



Comparative Performance Properties

Rheological and optical properties of paints made from ENCOR® DT 211 are virtually identical to those made from Competitor A. Dry-through times at high-humidity are 6-25 minutes faster for ENCOR® DT 211.

Formulations based on ENCOR® DT 211 exhibit superior “wet conditions” performance. This advantage allows for paint application under a wider range of climatic conditions, without compromising final film performance.

Comparative Performance Properties of ENCOR® DT 211 versus Fast-Dry Competitive Product								
Formulation Properties	Fast-Dry Missouri Yellow		Fast-Dry Missouri White		Fast-Dry Wyoming Yellow		Fast-Dry Wyoming White	
	DT 211	Comp. A	DT 211	Comp. A	DT-211	Comp. A	DT 211	Comp. A
Stormer Viscosity, KU								
Initial	93	88	90	91	87	83	83	79
24-Hr	90	90	90	90	83	83	80	81
5-day, 60°C	91	91	91	91	88	86	91	86
Density, lb/gal	12.4	12.4	12.7	12.8	13.1	13.1	13.8	14.0
Dry-Through Time, min¹ 92% R. H./72°F	42	53	62	68	44	69	45	65
CIE Color¹								
x	0.496	0.498	—	—	0.487	0.490	—	—
y	0.431	0.432	—	—	0.436	0.438	—	—
Reflectance	51.0	51.5	87.0	86.9	50.4	52.2	91.9	92.4
Contrast Ratio²	0.952	0.942	0.972	0.970	0.896	0.887	0.954	0.956
<i>1=15-mil film</i>	<i>2=5-mil wet film</i>		<i>For formulations referenced above, please see pages 6 and 7</i>					

Table 1

Water Resistance

Film Wash Up

The film wash-off test simulates rain soon after the paint is applied. 15-mil wet film drawdowns on glass are subjected to running water at a flow rate of 150-180 gallons per hour. The test results in **Table II** show the time in seconds to film breakthrough (the point at which glass can be seen through the eroded film). Each paint was evaluated after drying 20, 30, 40, and 50 minutes.

Three of the four paints made with ENCOR® DT 211 pass the wash-off test after drying for only 30 minutes. None of the paints made with Competitor A passed after drying for 30 minutes.

Film Wash-off*								
Film Dry Time, min	Fast-Dry Missouri Yellow		Fast-Dry Missouri White		Fast-Dry Wyoming Yellow		Fast-Dry Wyoming White	
	DT 211	Comp. A	DT 211	Comp. A	DT-211	Comp. A	DT 211	Comp. A
20	20	10	90	10	120	90	80	70
30	120	20	Pass	30	Pass	250	Pass	Blisters
40	Pass	70	Pass	Very Soft	Pass	Pass	Pass	Pass
50	Pass	No Adhesion	Pass	Pass	Pass	Pass	Pass	Pass
<i>* Time to film breakthrough in seconds; “pass” indicates greater than 300 seconds.</i>								

Table II

Figure 1: Illustrates the film wash-off performance of ENCOR® DT 211 versus a competitive product in the Missouri White traffic paint formulation. ENCOR® DT 211 films are on the top row while the competitive product is on the bottom row, for 50-, 40- and 30-minute dry times (left to right).

ENCOR® DT 211

Competitor A

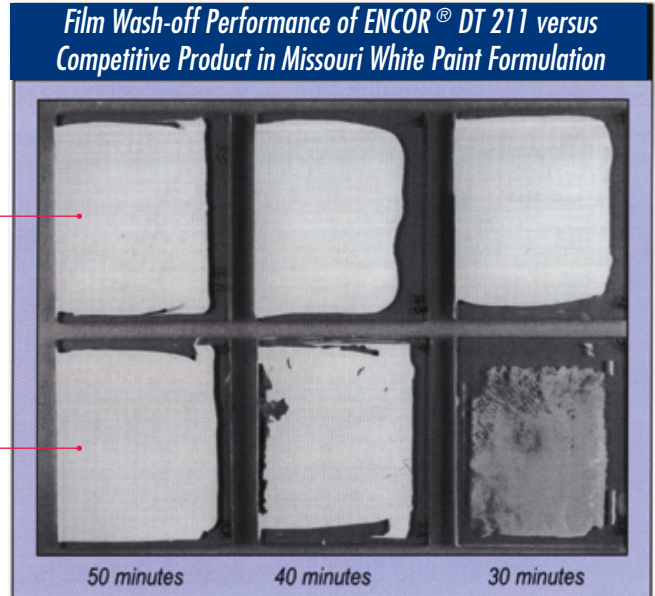


Figure 1

Dry Time

“No-Track Time,” which is also referred to as “No-Pick-Up-Time,” seeks to evaluate the drying time of traffic paints in the lab. It is accomplished per ASTM method D 711 by first drawing down a paint formulation over a glass plate to a typical wet film thickness of 15 mils. A steel cylinder weighing approximately 11 pounds with rubber o-rings for “wheels” is released from an incline plane rolling down over the paint film. A “passing” roll is one where no paint film is picked up by the o-ring wheels. A timer or stopwatch is used to quantify the time of dry. Federal and most state specifications have a 10-minute maximum no-track time which is generally equivalent to drying time in the field of 1-2 minutes. Results comparing no-track performance of ENCOR® DT 211 and Competitor A in both methanol and methanol-free formulations substituted on equal volume solids basis are shown in **Figure 2**. ENCOR® DT 211 performs exceptionally well with drying times of 5 to 7 minutes, which is a 200% improvement over the competitive product.

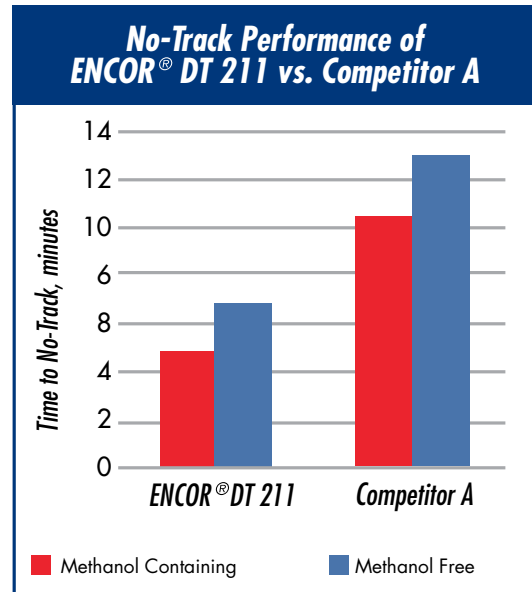
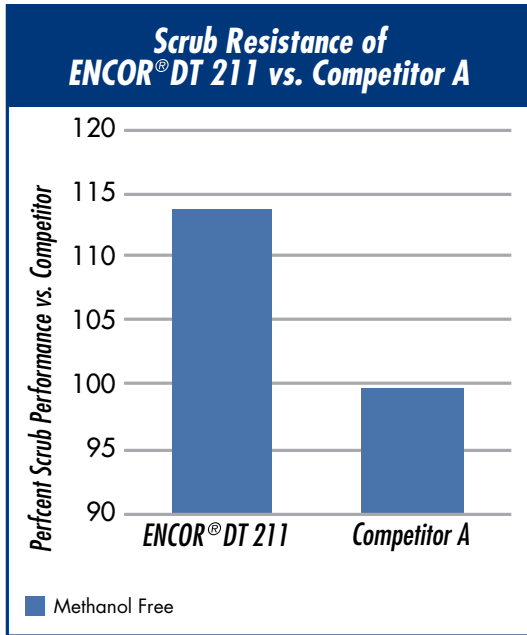


Figure 2

Scrub Resistance



Scrub resistance, which is conducted using ASTM method D 2486, is used by some traffic latex suppliers, traffic paint companies, and DOTs to quantitatively evaluate the wet erosion resistance of traffic paints in the lab. By scrubbing traffic paints of similar film thickness that are coalesced under the same drying conditions, this test seeks to simulate and predict field performance of traffic markings on longterm exposure to tires traversing or skidding across line markings. As noted in **Figure 3**, ENCOR® DT 211 exhibits superior scrub resistance when compared to the other competitive first-generation all acrylic fast dry latex in the same methanol-free test paint formulation. Both latexes were substituted into this formulation on an equal volume basis. The latest test deck data from Oregon below dramatically illustrates that the most durable lines on the deck were based on Arkema Traffic latexes, including ENCOR® DT 211.

Figure 3

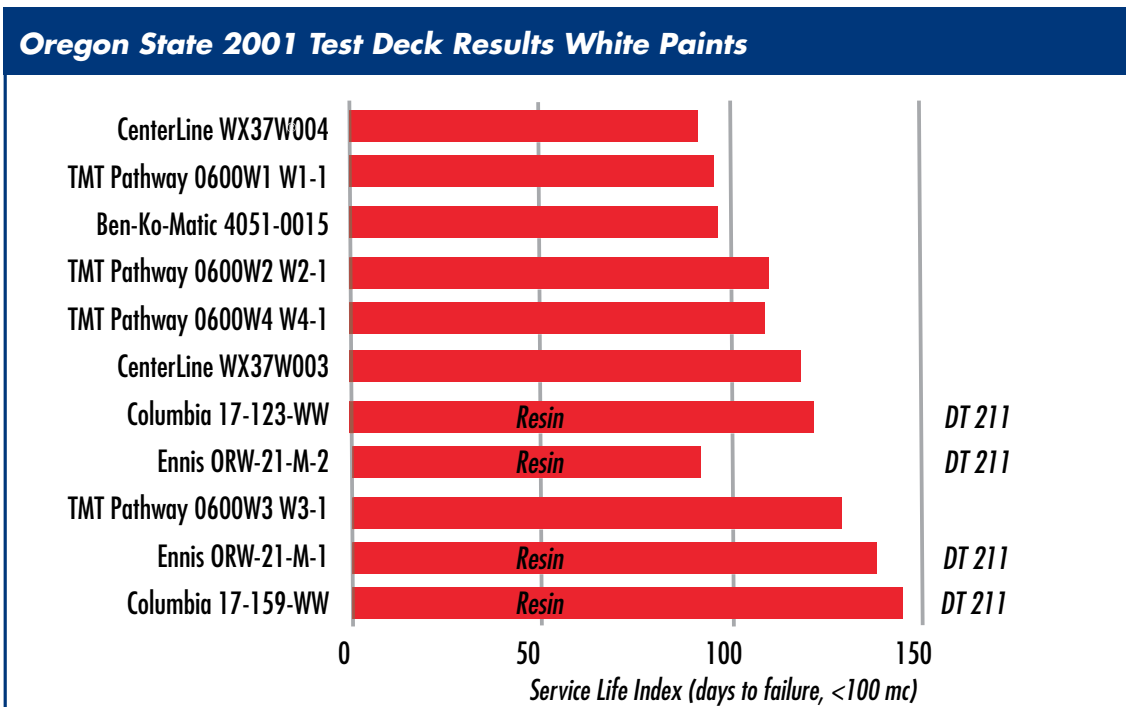


Figure 4

ENCOR® DT 211

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Formulation Suggestions

Fast Dry Missouri Yellow Traffic Paint

Ingredients	Lbs	Gallons
ENCOR® DT 211	400.0	45.20
DOWICIL* 75	0.5	0.04
Drewplus L-493	4.0	0.52
Rhodamine 226/35	10.0	0.98
Yellow 1250	50.0	4.05
YLO 1888D	2.0	0.06
Ti-Pure R-900	40.0	1.20
Natrosol 250 HBR	0.3	0.03
Water	23.0	2.76
Mississippi Lime M-60	125.0	5.27
Huber Q-6	450.0	19.91
ENCOR® DT 211	127.0	14.35
Drewplus L-493	1.0	0.13
Methanol	28.0	4.22
Drewplus L-493	1.0	0.13
Texanol	23.0	2.91
TOTAL	1284.8	101.76

Typical Paint Properties

Total Solids, %	
by weight	73.5
by volume	59.0
Pigment Volume Concentration (PVC), %	50.6
Pigment by Weight, %	51.8
Pigment by Volume, %	29.9
VOC, g/L	150

Formulation Suggestions

Fast Dry Missouri White Traffic Paint

Ingredients	Lbs	Gallons
ENCOR®DT 211	400.0	45.20
DOWICIL* 75	0.5	0.04
Drewplus L-493	3.0	0.44
Rhodamine 226/35	8.0	0.88
Ti-Pure R-900	100.0	3.00
Natrosol 250 HBR	0.5	0.05
Water	16.0	1.92
Mississippi Lime M-60	150.0	6.33
Huber M-6	430.0	19.03
ENCOR® DT 211	135.0	15.25
Drewplus L-493	1.0	0.13
Methanol	29.0	4.37
Drewplus L-493	1.0	0.13
Texanol	24.0	3.04
TOTAL	1298.0	99.81

Typical Paint Properties

Total Solids, %	
by weight	74.0
by volume	58.4
Pigment Volume Concentration (PVC), %	58.5
Pigment by Weight, %	52.3
Pigment by Volume, %	28.3
VOC, g/L	150

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Formulation Suggestions

Fast Dry Wyoming Yellow Traffic Paint

Ingredients	Lbs	Gallons
ENCOR® DT 211	453.5	51.19
DOWICIL* 75	0.5	0.04
Drewplus L-493	2.0	1.04
Rhodamine 226/35	7.2	0.68
Yellow 1250	32.0	2.58
Ti-Pure R-900	20.0	0.60
Natrosol 250 HBR	0.3	0.03
Water	25.0	3.00
Omyacarb 5	760.0	33.78
Drewplus L-493	1.8	0.23
Methanol	30.0	4.52
Drewplus L-493	1.8	0.23
Texanol	23.0	2.91
TOTAL	1357.1	100.83

Typical Paint Properties

Total Solids, %	
by weight	77.5
by volume	62.6
Pigment Volume Concentration (PVC), %	58.4
Pigment by Weight, %	59.7
Pigment by Volume, %	36.6
VOC, g/L	115

Formulation Suggestions

Fast Dry Wyoming White Traffic Paint

Ingredients	Lbs	Gallons
ENCOR® DT 211	453.5	51.19
DOWICIL* 75	0.5	0.04
Drewplus L-493	2.0	1.04
Rhodamine 226/35	7.2	0.68
Ti-Pure R-900	100.0	2.99
Natrosol 250 HBR	0.3	0.03
Water	24.0	2.88
Omyacarb 5	760.0	33.78
Drewplus L-493	1.8	0.23
Methanol	30.0	4.52
Drewplus L-493	1.8	0.23
Texanol	23.0	2.91
TOTAL	1404.0	100.52

Typical Paint Properties

Total Solids, %	
by weight	78.3
by volume	62.6
Pigment Volume Concentration (PVC), %	58.3
Pigment by Weight, %	61.2
Pigment by Volume, %	36.5
VOC, g/L	115

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Product Safety

Before handling the materials listed in this bulletin, read and understand the product MSDS (Material Safety Data Sheet) for additional information on personal protective equipment and for safety, health and environmental information. For environmental, safety and toxicological information, contact our Customer Service Department at 1-866-837-5532 to find an MSDS, or visit our web site: www.arkemacoatingresins.com

No chemical should be used as or in a food, drug, medical device, or cosmetic, or in a product or process in which it may contact a food, drug, medical device, or cosmetic until the user has determined the suitability and legality of the use. Since government regulations and use conditions are subject to change, it is the user's responsibility to determine that this information is appropriate and suitable under current, applicable laws and regulations.

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Storage and Handling

Follow procedures typically recommended for polymer dispersions. Use corrosion-resistant storage tanks and piping. Air-operated diaphragm pumps are preferred. Avoid temperature extremes. Do not freeze; store between 4-40°C.



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