



# Florida Department of Transportation

**CHARLIE CRIST**  
GOVERNOR

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**STEPHANIE KOPELOUSOS**  
SECRETARY

January 22, 2010

Monica Gourdine  
Program Operations Engineer  
Federal Highway Administration  
545 John Knox Road, Suite 200  
Tallahassee, Florida 32303

Re: Office of Design, Specifications  
Section 971  
Proposed Specification: 9710400 Traffic Marking Materials

Dear Ms. Gourdine:

We are submitting, for your approval, two copies of the above referenced Special Provision.

These changes were proposed by Chester Henson of the State Roadway Design Office to add durable waterborne paint.

Please review and transmit your comments, if any, within two weeks. Comments should be sent via Email to ST986RP or rudy.powell@dot.state.fl.us.

If you have any questions relating to this specification change, please call Rudy Powell, State Specifications Engineer at 414-4280.

Sincerely,

Rudy Powell, Jr., P.E.  
State Specifications Engineer

RP/dt

Attachment

cc: Gregory Jones, Chief Civil Litigation  
Florida Transportation Builders' Assoc.  
State Construction Engineer

**TRAFFIC MARKING MATERIALS.**

(REV ~~111-2120-1009~~)

SECTION 971-4 (of the Supplemental Specifications) is deleted and the following substituted:

**971-4 ~~Durable Waterborne Fast Dry Solvent~~ Traffic Paint.**

**971-4.1 General:** ~~Durable waterborne~~ Fast dry traffic paints intended for use under this Specification shall include products that are single packaged and ready mixed. Upon curing, these materials shall produce an adherent, reflective pavement marking capable of resisting deformation by traffic. The manufacturer shall have the option of formulating the material according to his own specifications. However, the requirements delineated in this Specification and Section 710 shall apply regardless of the type of formulation used. The material shall be free from all skins, dirt and foreign objects.

**971-4.2 Composition:**

Component	Test Method	Criteria
Total Solids, by weight	ASTM D 2369	75% minimum
Pigments, by weight	ASTM D 3723	57% minimum
Vehicle Solids, % of Vehicle *		40% minimum
TiO <sub>2</sub> , Type II Rutile (white paint only)	ASTM D 476	1.5 lb/gal minimum
Volatile Organic Content, (VOC)	ASTM D 3960	150 g/L maximum
<p><i>*Vehicle Solids % of Vehicle = <math>\frac{\% \text{ total solids} - \% \text{ pigment}}{100 - \% \text{ pigment}}</math></i>  <i>Vehicle solids shall be 100% acrylic emulsion polymer.</i></p>		

**971-4.3 Physical Requirements:** The material shall meet the following criteria:

Property	Test Method	Minimum	Maximum
Density	ASTM D 1475	13.5 ± <del>1.40</del> .37 lb/gal	N/A
<del>Consistency</del> <i>Viscosity</i> at 170°F	ASTM D 562	80 KU	100 KU
Fineness of Grind	ASTM D 1210	2 (HS)	3(HS)
Dry Opacity at 5 mils WFT	<del>Fed Std 141a Method 4121</del> <i>ASTM D 2805</i>	0.96	-
Bleed Ratio	<del>Fed Spec TT P-85D</del> <i>ASTM D 969</i>	0.95	-
Flexibility	<del>ASTM D 522 Method B</del> <i>Fed Spec TT P-115D</i>	Pass	-
Abrasion Resistance	971-4.3.2	Pass	-

**971-4.3.1 Set To Bear Traffic Time:** The material shall set to bear traffic in not more than ~~ten~~two minutes.

**971-4.3.2 Abrasion Resistance:** Test four samples per LOT using a Taber Abrader. The paint shall be applied to specimen plates using a drawdown blade having a clearance of 26 mils. Air dry each sample for 30 minutes and bake at 220°F for 18 hours. Clean with a soft brush and weigh each sample. Abrade samples for 1,000 cycles with ~~1.1 lb~~ *500 g* weights and CS-10 wheels. Clean the samples with a soft brush and weigh again. The average weight loss for the four plates shall not exceed ~~0.178 oz~~ *50 mg* per plate.

**971-4.3.3 Retroreflectivity:** The white and yellow pavement markings shall attain an initial retroreflectance of not less than 300 mcd/lx·m<sup>2</sup> and 250 mcd/lx·m<sup>2</sup>, respectively. The retroreflectance of the white and yellow pavement markings at the end of the ~~six~~ *18* month service life shall not be less than 150 mcd/lx·m<sup>2</sup>.

**971-4.4 Application Properties:** Application properties shall meet the requirements of Section 710.

**971-4.5 Packaging and Labeling:** The traffic paint shall be placed in 55 gallon open-end steel drums with a re-usable multi-seal sponge gasket. No more than 50 gallons of material shall be placed in any drum to allow for expansion during transport and storage.

**TRAFFIC MARKING MATERIALS.**  
**(REV 1-21-10)**

SECTION 971-4 (of the Supplemental Specifications) is deleted and the following substituted:

**971-4 Durable Waterborne Traffic Paint.**

**971-4.1 General:** Durable waterborne traffic paints intended for use under this Specification shall include products that are single packaged and ready mixed. Upon curing, these materials shall produce an adherent, reflective pavement marking capable of resisting deformation by traffic. The manufacturer shall have the option of formulating the material according to his own specifications. However, the requirements delineated in this Specification and Section 710 shall apply regardless of the type of formulation used. The material shall be free from all skins, dirt and foreign objects.

**971-4.2 Composition:**

Component	Test Method	Criteria
Total Solids, by weight	ASTM D 2369	75% minimum
Pigments, by weight	ASTM D 3723	57% minimum
Vehicle Solids, % of Vehicle*		40% minimum
TiO <sub>2</sub> , Type II Rutile (white paint only)	ASTM D 476	1.5 lb/gal minimum
Volatile Organic Content, (VOC)	ASTM D 3960	150 g/L maximum
*Vehicle Solids % of Vehicle = $\frac{\% \text{ total solids} - \% \text{ pigment}}{100 - \% \text{ pigment}}$ Vehicle solids shall be 100% acrylic emulsion polymer.		

**971-4.3 Physical Requirements:** The material shall meet the following criteria:

Property	Test Method	Minimum	Maximum
Density	ASTM D 1475	13.5 ± 1.4 lb/gal	N/A
Viscosity at 170°F	ASTM D 562	80 KU	100 KU
Fineness of Grind	ASTM D 1210	2 (HS)	3(HS)
Dry Opacity at 5 mils WFT	ASTM D 2805	0.96	-
Bleed Ratio	ASTM D 969	0.95	-
Flexibility	ASTM D 522 Method B	Pass	-
Abrasion Resistance	971-4.3.2	Pass	-

**971-4.3.1 Set To Bear Traffic Time:** The material shall set to bear traffic in not more than ten minutes.

**971-4.3.2 Abrasion Resistance:** Test four samples per LOT using a Taber Abrader. The paint shall be applied to specimen plates using a drawdown blade having a clearance of 26 mils. Air dry each sample for 30 minutes and bake at 220°F for 18 hours.

Clean with a soft brush and weigh each sample. Abrade samples for 1,000 cycles with 500 g weights and CS-10 wheels. Clean the samples with a soft brush and weigh again. The average weight loss for the four plates shall not exceed 50 mg per plate.

**971-4.3.3 Retroreflectivity:** The white and yellow pavement markings shall attain an initial retroreflectance of not less than  $300 \text{ mcd/lx}\cdot\text{m}^2$  and  $250 \text{ mcd/lx}\cdot\text{m}^2$ , respectively. The retroreflectance of the white and yellow pavement markings at the end of the 18 month service life shall not be less than  $150 \text{ mcd/lx}\cdot\text{m}^2$ .

**971-4.4 Application Properties:** Application properties shall meet the requirements of Section 710.

**971-4.5 Packaging and Labeling:** The traffic paint shall be placed in 55 gallon open-end steel drums with a re-usable multi-seal sponge gasket. No more than 50 gallons of material shall be placed in any drum to allow for expansion during transport and storage.