



Florida Department of Transportation

RON DESANTIS
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

KEVIN J. THIBAUT, P.E.
SECRETARY

January 12, 2021

Khoa Nguyen
Director, Office of Technical Services
Federal Highway Administration
3500 Financial Plaza, Suite 400
Tallahassee, Florida 32312

Re: State Specifications Office
Section: **413**
Proposed Specification: **4130302 Sealing Cracks and Concrete Structure Surfaces.**

Dear Mr. Nguyen:

We are submitting, for your approval, two copies of the above referenced Supplemental Specification.

The changes are proposed by Ronald Simmons from the State Materials Office to clarify requirements and update test methods.

Please review and transmit your comments, if any, within two weeks. Comments should be sent via email to daniel.strickland@dot.state.fl.us.

If you have any questions relating to this specification change, please call me at (850) 414-4130.

Sincerely,

Signature on file

Daniel Strickland, P.E.
State Specifications Engineer

DS/ra

Attachment

cc: Florida Transportation Builders' Assoc.
State Construction Engineer

**SEALING CRACKS AND CONCRETE STRUCTURE SURFACES
(REV 11-8-21)**

SUBARTICLE 413-3.2 is deleted and the following substituted:

413-3.2 Materials: Use a methacrylate system that has a three component formulation consisting of methacrylate monomer, cumene hydroperoxide (CHP) initiator, and cobalt promoter. The methacrylate system cannot contain wax. Use a HMWM monomer system that is approved by the Department and included on the Department’s Approved Product List (APL). Use initiator and promoter approved by the monomer manufacturer. Manufacturers seeking evaluation of their products must submit an application conforming to the requirements of Section 6 along with the following documentation:

1. Manufacturer’s material installation instructions showing the product can be installed in accordance with this Section.
2. Independent laboratory test data and results showing the product has been tested in accordance with the requirements of this Section and meets the requirements.
3. Qualification of their on-site representatives.

413-3.2.1 Properties: Use a methacrylate material system that meets the following physical and performance requirements:

Table 413-2 Physical Properties of Methacrylate <u>Resin System</u>	
<u>Viscosity (Brookfield RVT)</u>	<u>14-20 cps at 50 rpm</u>
Density (ASTM D1481)	8.5 - 9.0 lb/gl at 77° F
Flash Point (ASTM D93)	> 200°F (Pensky Martens CC)
Odor	Low
Bulk Cure Speed	3 Hours @ 73°F (max.)
Surface Cure	8 Hours @ 73°F (max.)
Gel Time ⁽¹⁾	60 minutes (max.) @ 73.4 ± 1.8°F
Tack Free Time	4-6 Hours (max.) (at 72°F and 50% Relative Humidity)
Compressive Strength (<u>ASTM D695</u> AASHTO T106)	6,500 psi (min)
Tensile Strength (ASTM C307 <u>D638</u>)	1,300 psi (min)
Shear Bond Adhesion (ASTM C882)	600 psi (min)
Elongation ⁽²⁾ (ASTM D638)	<u>10% to 30% Report</u>
<u>Physical Properties of Methacrylate monomer (Part A)</u>	
<u>Viscosity (ASTM D2196, Method A)</u> Wax Content	<u>14-20 cps using Ultra Low Adapter</u> θ
1. Use a test method capable of measuring the gel time to the nearest 0.5 minute.	
2. Do not use methacrylate with elongation less than 20% for concrete decks supported by steel girders.	

The monomer shall have a shelf life of no less than 12 months and shall be no more than 8 months old at the time of application. Provide each container shipped to the job site with the following information on a manufacturer’s label: manufacturer’s name, product name, lot or batch number, date of production, and drum serial number. Identify the catalysts by their generic classification and provide the date of manufacture.

SUBARTICLE 413-3.4.6 is deleted and the following substituted:

413-3.4.6 Sand Distribution: Apply sand over the monomer treated area within a timely period following the application of the polymer based on the manufacturer's recommendations for the existing conditions. Use equipment that will produce a uniform distribution of the sand over the treated area. If wheel mounted, use a sand spreader that has pneumatic tires compatible with the treatment material such that no tire footprints are left on the deck surface.

Use an initial application rate of ~~0.6~~1.0 (plus or minus 0.05) pounds of sand per square yard of treated ~~area, and~~area and adjust the rate as necessary to produce a friction number (FN) of no less than FN40R greater than or equal to 35 at 7 days. If friction numbers below those specified are obtained, completely remove all loose sand from the surface and re-apply the polymer at a rate of 150 square feet per gallon and spread additional sand as necessary to achieve the specified friction numbers. Remove the surface material by grinding, shot blasting, or other approved method if satisfactory friction values are not achieved. Friction tests must be conducted in accordance with AASHTO T242, using the ribbed tire option. Secure the services of an independent enterprise with prior experience on roadway friction testing with the equipment described to perform the friction tests.

**SEALING CRACKS AND CONCRETE STRUCTURE SURFACES
(REV 11-8-21)**

SUBARTICLE 413-3.2 is deleted and the following substituted:

413-3.2 Materials: Use a methacrylate system that has a three component formulation consisting of methacrylate monomer, cumene hydroperoxide (CHP) initiator, and cobalt promoter. The methacrylate system cannot contain wax. Use a HMWM system that is approved by the Department and included on the Department’s Approved Product List (APL). Manufacturers seeking evaluation of their products must submit an application conforming to the requirements of Section 6 along with the following documentation:

1. Manufacturer’s material installation instructions showing the product can be installed in accordance with this Section.
2. Independent laboratory test data and results showing the product has been tested in accordance with the requirements of this Section and meets the requirements.
3. Qualification of their on-site representatives.

413-3.2.1 Properties: Use a methacrylate system that meets the following physical and performance requirements:

Table 413-2 Physical Properties of Methacrylate System	
Density (ASTM D1481)	8.5 - 9.0 lb/gl at 77° F
Flash Point (ASTM D93)	> 200°F (Pensky Martens CC)
Odor	Low
Bulk Cure Speed	3 Hours @ 73°F (max.)
Surface Cure	8 Hours @ 73°F (max.)
Gel Time ⁽¹⁾	60 minutes (max.) @ 73.4 ± 1.8°F
Tack Free Time	4-6 Hours (max.) (at 72°F and 50% Relative Humidity)
Compressive Strength (ASTM D695)	6,500 psi (min)
Tensile Strength (ASTM D638)	1,300 psi (min)
Shear Bond Adhesion (ASTM C882)	600 psi (min)
Elongation ⁽²⁾ (ASTM D638)	Report
Physical Properties of Methacrylate monomer (Part A)	
Viscosity (ASTM D2196, Method A)	14-20 cps using Ultra Low Adapter
1. Use a test method capable of measuring the gel time to the nearest 0.5 minute.	
2. Do not use methacrylate with elongation less than 20% for concrete decks supported by steel girders.	

The monomer shall have a shelf life of no less than 12 months and shall be no more than 8 months old at the time of application. Provide each container shipped to the job site with the following information on a manufacturer’s label: manufacturer’s name, product name, lot or batch number, date of production, and drum serial number. Identify the catalysts by their generic classification and provide the date of manufacture.

SUBARTICLE 413-3.4.6 is deleted and the following substituted:

413-3.4.6 Sand Distribution: Apply sand over the monomer treated area within a timely period following the application of the polymer based on the manufacturer's recommendations for the existing conditions. Use equipment that will produce a uniform distribution of the sand over the treated area. If wheel mounted, use a sand spreader that has pneumatic tires compatible with the treatment material such that no tire footprints are left on the deck surface.

Use an initial application rate of 1.0 (plus or minus 0.05) pounds of sand per square yard of treated area and adjust the rate as necessary to produce a friction number (FN) of no less than FN40R greater than or equal to 35 at 7 days. If friction numbers below those specified are obtained, completely remove all loose sand from the surface and re-apply the polymer at a rate of 150 square feet per gallon and spread additional sand as necessary to achieve the specified friction numbers. Remove the surface material by grinding, shot blasting, or other approved method if satisfactory friction values are not achieved. Friction tests must be conducted in accordance with AASHTO T242, using the ribbed tire option. Secure the services of an independent enterprise with prior experience on roadway friction testing with the equipment described to perform the friction tests.