NTPEP Committee Work Plan for

Evaluation of Concrete Curing Compounds

NTPEP Designation: [CCC-16-01]
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Evaluation of Compounds for Curing Concrete

1 SCOPE

1.1 This project work plan covers the procedures used by the National Transportation Product Evaluation Program (NTPEP) to test liquid membrane-forming compounds for curing concrete.

1.2 The NTPEP is a voluntary program whereby manufacturers may choose to have their products evaluated for a fee that is used to cover the costs of the evaluation and producing the associated reports. It is the goal of the NTPEP to eliminate duplicate testing of products by member states by providing a process where manufacturer/suppliers submit their products to the NTPEP for testing. The NTPEP reports the results of these tests to its member states, but does not accept or reject products. However, transportation officials may choose to use these results in developing and maintaining an approved/qualified products list.

1.3 The NTPEP is a technical service program of the American Association of State Highway and Transportation Officials (AASHTO). This document and other documents produced by the NTPEP may not be reproduced without the expressed prior written permission of AASHTO.

1.4 The panel consists of representatives of NTPEP member states who wish to actively serve in the evaluation process of concrete curing compounds. These representatives are voting members. In addition, it is desired that there be two non-voting industry representatives to serve as resources to the panel. The industry representatives may not represent the same company. It is the responsibility of industry in general, to elect/nominate its two members to serve on the panel. In addition, at any open meeting, views and comments of any industry representative may be voiced.

1.5 This work plan may involve the handling of hazardous materials, operations, and equipment. It does not purport to address all safety problems associated with its use. When conducting evaluations for the test methods included in this work plan, please use personal protective equipment (PPE). It is the responsibility of the user to establish the appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.
2 REFERENCED STANDARD SPECIFICATIONS

2.1 Unless otherwise noted, all references to test methods and standards are intended to be of the most current versions. Testing facilities producing NTPEP reports are directed to note the year designation of every test method and standard referenced in the report.

- ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
- ASTM D1644 - Standard Test Methods for Nonvolatile Content of Varnishes
- ASTM D93 - Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester
- ASTM E1252, Standard Practice for General Techniques for Obtaining Infrared Spectra for Qualitative Analysis
- ASTM E1347 - Standard Test Method for Color and Color-Difference Measurement by Tristimulus Colorimetry
- AASHTO T 155 - Standard Method of Test for Water Retention by Liquid Membrane-Forming Curing Compounds for Concrete

3 TESTING PROTOCOLS AND LABORATORY SELECTION

3.1 The testing protocols for liquid membrane-forming compounds will be ASTM C309 Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete, ASTM D1644 Nonvolatile Content Test, ASTM D93 Pensky-Martens Flash Point Test, and Fourier Transform Infrared Spectroscopy, with the Settling Test (Type 2, White Pigmented Cure). The following will be conducted:

- Minnesota DOT Three-Day Settlement Test
  - Pour curing compound into a 100 ml graduated cylinder until bottom of the meniscus reaches the 100 ml mark. The graduated cylinder shall have sub-divisions of 1 ml.
  - Using disposable pipette, remove any air bubbles incorporated into curing compound upon pouring into graduated cylinder. At this time you may add or extract excess curing compound to reach the 100 ml mark.
  - Secure a rubber stopper in the graduated cylinder to minimize evaporation and leave sample undisturbed for 3 days (72 hours). At the end of the 3-day period, measure the amount of settling to the nearest ml. The degree of settling is the amount of clear, colorless supernatant liquid in the graduated cylinder.

3.2 The testing laboratory(ies) will be selected by the panel, and may be either a NTPEP member state or a private independent laboratory. The laboratory(ies) selected must have regular AASHTO or CCRL inspection of the laboratory environment and critical equipment used for the applicable tests.
3.3 The final decision of laboratory selection(s) rests with the NTPEP Manager and the Chairman of the Concrete Curing Compound Panel. However, input from the rest of the panel (including industry) is expected and welcome. All concerns will be duly considered before laboratory selection(s) are made.

4 TESTING CYCLE SCHEDULING

4.1 The bi-annual cycle will be finalized by the NTPEP Manager and the panel, but will generally follow the pattern below.

4.2 The invitations to participate will be mailed out to industry in January and July, with all paper submittals due to AASHTO in February and August respectively.

4.3 Results will be made available for manufacturer’s review approximately 6 months after submittal.

4.4 At times, it may be necessary to limit the number of submittals from each manufacturer for an evaluation period to maintain a manageable workload. Any decision by the panel to limit submittals for a cycle will be based on the testing capacity of the laboratory(ies) contracted.

5 MANUFACTURER’S DOCUMENTATION

5.1 When submitting a product to the NTPEP for testing, the manufacturer must supply certified documentation as follows:

- The brand name and designation
- The composition or description of the curing compound
- The manufacturer’s recommended application rate
- The infrared spectrum
- Safety Data Sheet (SDS)
- VOC compliance certification (National AIM)
- The manner in which the material will be identified on containers
- Instructions for use, including mixing, and application. Emphasize any special requirements such as heat sensitivity during mixing, unique handling, etc.
- Certify in a signed letter that as long as a material is furnished under the submitted brand name and designation, the material will be of the same composition and formulation as originally evaluated by NTPEP

5.2 Before proceeding with any portion of the testing, all documentation submitted by the manufacturer will be reviewed by the NTPEP Manager and the lead testing state. Should any of the certified data fail to comply with the specifications, that particular material will not be accepted for testing.

6 SAMPLING

6.1 Each sample shall be at least one quart and shipped within thirty days of sampling notice in a clearly labeled, durable, sealed container, marked with the NTPEP CCC number (year-cycle-sample #), product name, and batch/lot number.

6.2 It is the manufacturer/supplier’s responsibility to ship the marked sample(s) to the testing laboratory. All SDS(s) and other required documentation (Product Data Sheets, Dosage Recommendations, etc) are required to be included in the shipment.
7 LABORATORY TESTING

7.1 The manufacturer has the option of observing the testing of their material for all phases. If a manufacturer's representative elects to observe portions of the testing, they must be present at the predetermined times when testing is scheduled. Scheduled testing will not be delayed at the request of a manufacturer for the purpose of their observation.

7.2 The panel will not accept replacement material once testing of a material has begun in a submittal period. Fees paid by the manufacturer will not be refunded once testing begins.

8 TESTING AND REPORTING

8.1 The results from the NTPEP contracted laboratory(ies) will be determined using the following methods in addition to those cited in ASTM C309:
- ASTM D93, Standard Test Method for Flash Point by Pensky-Martens Closed Cup Tester
- Fourier Transform Infrared Spectroscopy (FTIR) Scan
- Minnesota DOT Settling Test

8.2 All of the general information required by section 5 above will be published in the final report.

8.3 The final report issued by the panel will also contain the test data generated by the contracted NTPEP laboratory(ies). The results from ASTM C309 testing will be reported for each product in a format similar, but not necessarily identical to the following:

<table>
<thead>
<tr>
<th>NTPEP ID #, Manufacturer, Product Name, Product Type</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>TEST</th>
<th>NTPEP RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color (ASTM C309)</td>
<td></td>
</tr>
<tr>
<td>Consistency (ASTM C309)</td>
<td></td>
</tr>
<tr>
<td>Condition of film at 7 days (ASTM C309)</td>
<td></td>
</tr>
<tr>
<td>Deleterious Reaction with Concrete (ASTM C309)</td>
<td></td>
</tr>
<tr>
<td>Water Retention Test (AASHTO T 155)</td>
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| Method of Application                          |                                      |
| Density (kg/m³)                                |                                      |
| Moisture Loss (kg/m²)@ 24 hrs                  |                                      |
| Moisture Loss (kg/m²)@ 72 hrs                  |                                      |
| Reflectance Test (ASTM E1347) [using CIE D65/2o]|                                      |
| Drying Time Test (Hr:Min) (ASTM C309)          |                                      |
| Three-Day Settling Test (see 3.1)              |                                      |
| Nonvolatile Content Test (ASTM D1644, Method A)|                                      |
| Pensky-Martens Flash Point Test (ASTM D93)     |                                      |

8.4 The IR spectrum will be determined using Fourier transform infrared spectroscopy, FTIR, using the horizontal attenuated total reflectance method, HATR. FTIR spectra shall be collected at 16 scans using a diamond crystal. The method of obtaining the spectrum shall be noted on the uploaded spectrum. The uploaded scan will also include the 1) Manufacturer Name, 2) Product Name, 3) NTPEP Number, 4) Lot Number, 5) Lab ID, and 6) Date. Laboratory project identification may also be included, but is not required. In order to maintain confidentiality of proprietary information, IR scans will not be part of evaluation reports. IR Scans will be password protected and available to NTPEP member states through DataMine.
9 REVIEW OF DATA BEFORE PUBLICATION OR DISTRIBUTION

9.1 Manufacturers shall have the right to review test data of their product(s) prior to public release. In the event of a disputed result, it may be appealed under the guidelines of the NTPEP Information and Operations Guide.

9.2 All data generated by the technical committee shall be subject to NTPEP policy in regard to early release and dissemination to NTPEP member states.

9.3 Data generated by the technical committee may be published by a manufacturer under the guidelines of NTPEP policy.

10 RE-SUBMITTAL AND RE-TESTING

10.1 The manufacturer may elect to re-submit products for full testing to fulfill member state's requirements to be maintained on their approved/qualified products list. Any re-submittal must be submitted once every three (3) years. If re-submittals have not been received by the end of the third year, then the product will be removed from the list.

10.2 The manufacturer will be allowed to change the name of a product without re-testing, provided that documentation is furnished certifying the composition and formulation is the same as the product evaluated by the NTPEP. Such name changes will be documented in the next NTPEP report. No confirmation testing will be performed unless the manufacturer submits the material through the normal process and pays the subsequent fees.

11 FEES

11.1 Fees to cover the cost of NTPEP testing and reporting will be determined by the NTPEP Manager. Current test fees are available on the CCC home page and at http://www.ntpep.org or http://data.ntpep.org.