1.0 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 manufacturers 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 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.

2.0 Testing Protocols and Laboratory Selection.

2.1 The testing protocols for liquid membrane-forming compounds will be AASHTO M 148, Liquid Membrane-Forming Compounds for Curing Concrete, and ASTM E 1252, Practice for General Techniques for Obtaining Infrared Spectra for Qualitative Analysis, with the Settling Test (Type 2, White Pigmented Cure). The following will be conducted:

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.

2.2 The testing laboratory(s) will be selected by the panel, and may be either a NTPEP member state or a private independent laboratory. The laboratory(s) selected must have regular AASHTO or CCRL inspection of the laboratory environment and critical
equipment used for the applicable tests.

2.3 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.

3.0 Testing Cycle Scheduling:

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

3.1.1 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.
3.1.2 Results will be made available for manufacturer’s review approximately 6 months after submittal.
3.2 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(s) contracted.

4.0 Manufacturer’s Documentation

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

4.1.1 The brand name and designation.
4.1.2 The composition or description of the curing compound.
4.1.3 The manufacturer’s recommended application rate.
4.1.4 The infrared spectrum.
4.1.5 Material Safety Data Sheet (MSDS).
4.1.6 VOC compliance certification (National AIM)
4.1.7 The manner in which the material will be identified on containers.
4.1.8 Instructions for use, including mixing, and application. Emphasize any special requirements such as heat sensitivity during mixing, unique handling, etc.

4.2 Certify, 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 the NTPEP.

4.3 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.

5.0 Sampling

5.1 After receipt of the approved submittals, the lead testing state will contact the manufacturer/supplier to make arrangements for random sampling for each material or type to be tested. An inspector from an AASHTO Member Department will obtain and mark the random sample(s) at the point of manufacture, or domestic distribution point. The sample may be taken from anywhere that is convenient (drums, totes or bulk), provided that it is random sample that represents a production run of the material that was submitted for evaluation. The producer will be expected to assist the NTPEP representative with the sampling.

5.2 Each sample should be at least 2 liters (1/2 gallon) in a container supplied by the manufacturer/supplier. The inspector will mark the container with the NTPEP test sample number and the manufacturer's batch or lot number. The marked sample(s) will be returned to the manufacturer/supplier for shipping.
5.3 It is the manufacturer/supplier’s responsibility to ship the marked sample(s) to the testing laboratory following the instructions of the lead testing state.

6.0 Laboratory Testing

6.1 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.

6.2 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.

7.0 Testing and Reporting

7.1 The results from the NTPEP contracted laboratory(s) will be determined using the following methods cited in AASHTO M 148:
- ASTM D56 Flash Point by Tag Closed Cup Tester
- Minnesota DOT Settling Test
- ASTM D1644 Nonvolatile Content of Varnishes
- D3960 Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings

The infrared spectroscopy shall be determined using ASTM E1252.

7.2 All of the general information required by 4.1 and 4.2 above will be published in the final report.

7.3 The final report issued by the panel will also contain the test data generated by the contracted NTPEP laboratory(s). The results from AASHTO M 148 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>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>TEST</th>
<th>NTPEP RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color (M 148)</td>
<td></td>
</tr>
<tr>
<td>Consistency (M 148)</td>
<td></td>
</tr>
<tr>
<td>Condition of film at 7 days (M 148)</td>
<td></td>
</tr>
<tr>
<td>Deleterious Reaction with Concrete (M 148)</td>
<td></td>
</tr>
<tr>
<td>Water Retention Test: (T 155)</td>
<td>Method of Application</td>
</tr>
<tr>
<td></td>
<td>Rate of Application (L/m²)</td>
</tr>
<tr>
<td></td>
<td>Density (kg/m³)</td>
</tr>
<tr>
<td></td>
<td>Moisture Loss (kg/m³)@ 24 hrs</td>
</tr>
<tr>
<td></td>
<td>Moisture Loss (kg/m³)@ 72 hrs</td>
</tr>
<tr>
<td>Reflectance Test (ASTM E 1347) [using CIE D65/2.0]</td>
<td></td>
</tr>
<tr>
<td>Drying Time Test (Hr:Min) (M 148)</td>
<td></td>
</tr>
<tr>
<td>Three-Day Settling Test (see 2.1)</td>
<td></td>
</tr>
<tr>
<td>Nonvolatile Content Test (ASTM D 1644, Method A)</td>
<td></td>
</tr>
<tr>
<td>Flash Point Test (ASTM D 56)</td>
<td></td>
</tr>
<tr>
<td>Volatile Organic Compound (ASTM D 3960)</td>
<td></td>
</tr>
</tbody>
</table>

7.4 In addition, the results for all products tested during a cycle will be presented in tabular form similar to but not necessarily identical to that in Figure 1.
7.5 The IR spectrum will be determined using ASTM E 1252. In order to maintain confidentiality of proprietary information, it will not be presented in the report. The IR spectrum will be retained in AASHTO headquarters by the NTPEP Manager. This information will be made available to the States on request.

8.0 Review of Data Before Publication or Distribution

8.1 Manufacturers have the right to review test data of their product(s) for 30 calendar days after their receipt of the test data before publication. In the case of disputed test results, the manufacturer must respond within 14 days after receiving the data. Disputes may be appealed under the guidelines of the NTPEP policy.

8.2 All data generated by the panel is subject to NTPEP policy in regard to early release and dissemination to NTPEP member states.

8.3 Data generated by the panel may be published by a manufacturer under the guidelines of NTPEP policy.

Figure 1
SUMMARY OF TEST DATA FOR ALL PRODUCTS

<table>
<thead>
<tr>
<th>NTPEP NO.</th>
<th>MFG</th>
<th>NAME</th>
<th>COLOR</th>
<th>CONSISTENCY</th>
<th>FILM COND</th>
<th>DELETERIOUS REACTION</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>NTPEP NO.</th>
<th>MFG</th>
<th>NAME</th>
<th>APPL METHOD</th>
<th>TEST DURATION</th>
<th>RATE OF APPL</th>
<th>DENSITY</th>
<th>MOISTURE LOSS</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>NTPEP NO.</th>
<th>MFG</th>
<th>NAME</th>
<th>REFL</th>
<th>DRY TIME</th>
<th>SETTLING TEST (ml/100ml)</th>
<th>Nonvolatile Content %</th>
<th>FLASH POINT</th>
<th>VOC</th>
</tr>
</thead>
</table>

9.0 Re-Submittal and Re-Testing

9.1 The manufacturer may elect to re-submit products for full testing to fulfill member state's requirements to be maintained on their qualified products list (QPL). 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.

9.2 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.

10.0 Fees

Fees to cover the cost of NTPEP testing and reporting will be determined by the NTPEP Manager.