TECHNICAL COMMITTEE UPDATE

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Phil Ostrowski, Special Materials Company
RCMA DURABILITY STUDY UPDATE

Multi-year Project to Determine the Effect of Roof Coatings on Membrane Performance and Weathering Performance of Coatings
5 MINUTE REFRESHER COURSE
Selection of Coatings

- White Acrylic
- White Styrene Acrylic
- White SEBS
- Asphalt Emulsion
- High Softening Point Aluminized Asphalt
- Low Softening Point Aluminized Asphalt
- Water Based Aluminized Asphalt
- No Coating
How Were the Coatings Selected?

• 3 manufacturers of each type selected at random

• 3 manufacturers submitted blind samples

• 1 of the samples chosen for the study
The Substrates

• **BUR**
  • 2 Plies of Type IV Glass and 1 G2 Base in Type IV Asphalt

• **SBS**
  • G2 Base, SBS Granule Cap in Type IV Asphalt

• **APP**
  • G2 Base, APP Smooth – Torched

• **EPDM**
  • 45 mil (Black)

• **Insulation/Deck**
  • ½ Plywood, 2” Iso + ½” Cover board
Deck Design

- 2 square feet per section
- 8 separate sections
- Built for Testing Not as Roofing
- Allows for 4 separate tests
- Small Initial Deck produced for Initial Test
Location of Decks

- Northeast Ohio: Warm, Cold, Wet, Dry
- Arizona: Hot, Dry
- South Florida: Hot, Wet
Accelerated Aging

- UV Condensation (2000 hrs.)
  - ASTM D 4799, Cycle B (8 hrs. light 60°C, 4 hrs. condensation 50°C)

- Xenon Arc (2000 hrs.)
  - ASTM D 4798, Cycle A (51 min. light, 9 min. light and water spray)

- Monitor Change in Reflectance and Emissivity
Testing Protocol for BUR, SBS and APP Decks

- Tensile / Elongation
- Reflectance
- Softening Point
- Penetration
- Iatroscan* (not run on BUR)
- DSR* (not performed)
Testing Protocol for EPDM Deck

• Tensile / Elongation
• Reflectance
• Cold Bend*
• Thickness
## Membrane Initial Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Membrane Identification</td>
<td>APP</td>
</tr>
<tr>
<td>Softening Point, °F</td>
<td>306</td>
</tr>
<tr>
<td>Penetration, dmm</td>
<td>16</td>
</tr>
<tr>
<td>Tensile Strength, Peak Load, MD, lbf.</td>
<td>123</td>
</tr>
<tr>
<td>Elongation, at Peak Load, MD, %</td>
<td>51</td>
</tr>
<tr>
<td>Iatroscan Composition</td>
<td></td>
</tr>
<tr>
<td>Saturates, %</td>
<td>16.2</td>
</tr>
<tr>
<td>Aromatics, %</td>
<td>39.7</td>
</tr>
<tr>
<td>Resins, %</td>
<td>36.5</td>
</tr>
<tr>
<td>Asphaltenes, %</td>
<td>7.6</td>
</tr>
<tr>
<td>DSR</td>
<td>TBD</td>
</tr>
</tbody>
</table>
## Membrane Initial Properties

<table>
<thead>
<tr>
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<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Membrane Identification</td>
<td>EPDM</td>
</tr>
<tr>
<td>Thickness, in.</td>
<td>0.435</td>
</tr>
<tr>
<td>Tensile Strength, psi</td>
<td>1389</td>
</tr>
<tr>
<td>Ultimate Elongation, %</td>
<td>893</td>
</tr>
<tr>
<td>Tear Resistance, lbf.</td>
<td>10</td>
</tr>
</tbody>
</table>
Decks In NE Ohio 11-06

SBS
MOVING FORWARD

2013 and beyond...
Two historical cuts available

• 2008 (3 year decks)
• 2012 (7 year decks)
• Midwest Exposure
• Samples are in Good Shape
Tests to be Performed

- Asphaltics
  - Tensile / Elongation
  - Reflectance (Cleaned and Uncleaned)
  - Softening Point
  - Penetration
  - Iatroscan (maybe)

- EPDM
  - Tensile / Elongation
  - Reflectance (Cleaned and Uncleaned)
  - Cold Bend*
  - Thickness
Eliminated from Study

• Florida and Arizona Decks
• SEBS White Coatings
• Non-controlled Data
  • DSR
  • Iatroscan*
Data

• Thought
  • Use for reflectance equipment testing

• Review

• Publish?
QUESTIONS?
DIMETHYL CARBONATE EXEMPTION UPDATE
Dimethyl Carbonate Exemption

**Background**
- DMC was granted a Federal VOC exemption in 2009.
- DMC not granted exemption in SCAQMD because of inhalation development toxicity mouse study in 1992.
- Study made no distinction made between a mouse in a confined space and a worker in open air.
Dimethyl Carbonate Exemption

**SCAQMD Rule 1113**

- Rule 1113 covers architectural and roof coatings.

- Since SCAQMD has granted some use of DMC in select rules it might be possible to add it to Rule 1113.

- However, according to SCAQMD, Rule 1113 isn’t scheduled for amendment until around 2016.
Dimethyl Carbonate Exemption

**RCMA Next Steps**

- Roofing contractor survey to help determine estimated exposure while applying the material.

- Draft letter outlining our position and rationale for the DMC exemption.

- Investigate whether it would be possible to perform worker exposure assessment study.
### Dimethyl Carbonate Exemption

<table>
<thead>
<tr>
<th>Component</th>
<th>Mastic wt.%</th>
<th>Roof Coating wt.%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral Spirits</td>
<td>21</td>
<td>28</td>
</tr>
<tr>
<td>Asphalt</td>
<td>48</td>
<td>67</td>
</tr>
<tr>
<td>Surfactant</td>
<td>&lt;0.5</td>
<td>&lt;0.2</td>
</tr>
<tr>
<td>Attapulgite Clay</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Cellulose Fiber</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Calcium Carbonate</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>
Dimethyl Carbonate Exemption

Roofing Contractor Survey
- In order to estimate exposure to solvents from roof coatings information on the application of roof coatings is needed.
Dimethyl Carbonate Exemption

- Are there any standard applications instructions that have been prepared for roof coating products?

- Approximate range in roof coating application rate (e.g., gallons/hr.) and the application method (e.g., rolled, brushed, sprayed)? This information will provide an estimated exposure while applying the material.

- What portion of the workers day is spent in applying the roof coating? What is the approximate range in worker’s day applying roof coatings? This information will provide an estimated 8-hr TWA.
Dimethyl Carbonate Exemption

- Are there any standard applications instructions that have been prepared for mastic products?

- Approximate range in mastic application rate (e.g., gallons/hr.) and the application method (e.g., rolled, brushed, sprayed)? This information will provide an estimated exposure while applying the material.

- What portion of the workers day is spent in applying the mastic? What is the approximate range in worker’s day applying mastic? This information will provide an estimated 8-hr TWA.
QUESTIONS?
ALTERNATE TEST METHODS STUDY UPDATE
Alternate Test Methods Study

**Background**
- RCMA interested in using alternate measuring methods to determine reflectance and/or emissivity.
- The study would see if there is a mathematical correlation to the results obtained using these alternate methods compared to those obtained by the D&S reflectometer and/or thermal emissivity sensor.
Alternate Test Methods Study

**New Developments**

- RCMA has had conversations with optics company suppliers about renting their equipment for a fee.

- Oak Ridge National Labs has agreed to help with the test method analysis, but is unable to draft the testing protocol due to other time commitments.
## Alternate Test Methods Study

<table>
<thead>
<tr>
<th>Supplier</th>
<th>Instrument</th>
<th>Willing to Loan?</th>
</tr>
</thead>
<tbody>
<tr>
<td>AZ Technologies</td>
<td>LPSR 300 TESA 2000</td>
<td>No, but will test submitted samples</td>
</tr>
<tr>
<td>Surface Optics</td>
<td>410 Solar 410 VIS</td>
<td>$2,000/week</td>
</tr>
<tr>
<td>Labsphere</td>
<td>?</td>
<td>Yes</td>
</tr>
<tr>
<td>Minolta</td>
<td>600d</td>
<td>$1,000/month (3 month min.)</td>
</tr>
<tr>
<td>BYK</td>
<td>Spectro-Guide Sphere</td>
<td>$950/month (3 month min.)</td>
</tr>
<tr>
<td>PP Systems</td>
<td>UniSpec-SC</td>
<td>Yes - TBD</td>
</tr>
<tr>
<td>Ocean Optics</td>
<td>Not Sure Yet</td>
<td>Yes, if they can</td>
</tr>
</tbody>
</table>
Alternate Test Methods Study

Next Steps

- RCMA needs to draft testing protocol.

- Interested RCMA members would be asked to submit blinded samples, the specific types of products are still to be determined.

- Goal would be to have new portable, lightweight, accurate, and affordable equipment available in 2015.
QUESTIONS?
Technical Bulletin Development

- At the RCMA Fall Meeting in October 2012, there a suggestion to draft a technical bulletin on coatings under solar panels.

- Is there interest in drafting this technical bulletin?

- Any other technical bulletin topics?
2013 COMMITTEE PLANNING
2013 Committee Planning

What other projects, programs, studies or initiatives should the Technical Committee pursue in 2013?
QUESTIONS?

RCMA
ROOF COATINGS
MANUFACTURERS ASSOCIATION