QUV-A Accelerated Weathering for Kreysler & Associates

Final Report

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Objective

To evaluate three pigmented Fireblock™ concrete samples exposed to QUV-A accelerated weathering for color change.

Materials

Kreysler and Associates provided three sets of panels for evaluation. The panel sets were labeled:

- 071514-1
- 071514-2
- 071514-3

Four samples were provided with each set. One panel was pulled from exposure from each set every 500 hours.

Approach

QUV-A

QUV-A accelerated exposure assessed weathering properties per ASTM G154 cycle 1. A panel was pulled and an evaluation of color occurred every 500 hours exposure time.

Color Measurements – Data color International Spectraflash SF600® Plus CT color computer with Chrom-calc® software calculated color values. The setup for color measurements is as follows.

- Large area view
- Specular reflections excluded
- 10° lamp angle
- Hunter color coordinates

Color was measured in a 3D color space with dimensions being L, a, and b.

- L – Is the degree of black and white. L values range between 0 and 100, with 0 being black and 100 being white.
- a – Is the degree of green and red. Values range from negative to positive with green being negative and red being positive.
- b – Is the degree of blue and yellow. b values range from negative to positive with blue being negative and yellow being positive.

Results were reported as total color change (∆E). Total color change is the square root of the sum of the squares of ∆L, “∆a” and “∆b” values.
Results

\( \Delta E \) color change over 2000 hours of QUV-A exposure is summarized below:

![Color Change - QUV-A Weathering](image)

<table>
<thead>
<tr>
<th>Exposure (hours)</th>
<th>071514-1 2000 hours</th>
<th>071514-2 2000 hours</th>
<th>071514-3 2000 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>500</td>
<td>0.25</td>
<td>0.36</td>
<td>0.24</td>
</tr>
<tr>
<td>1000</td>
<td>0.48</td>
<td>0.77</td>
<td>0.39</td>
</tr>
<tr>
<td>1500</td>
<td>0.67</td>
<td>1.02</td>
<td>0.69</td>
</tr>
<tr>
<td>2000</td>
<td>0.92</td>
<td>1.32</td>
<td>0.81</td>
</tr>
</tbody>
</table>

Conclusions

The panels show minimal color change over the course of 2000 hours of exposure.

References

UP-14-3099
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