National Electrical Manufacturers Association (NEMA) and SPFA

Recessed Lighting Research
1. Set out to write a White Paper or SOP to install spray foam around the recessed luminaires
2. Realized they did not have data to complete the task
3. Sought out cooperation from SPFA to conduct testing
PURPOSE

Conduct research regarding the heat buildup in recessed luminaires

With insulation in contact with the fixture housing
Study Plan

Measure the temperature of cellulose insulation compared to ocSPF and ccSPF in contact with the luminaire.
Goal

Develop application

Guidelines

For installing SPF in contact with recessed luminaires
Light Fixture – the physical parts of the light

Lamp – the bulb

Luminaire – the combination of fixture and lamp

This is to help anyone reading a report from NEMA or the lighting industry
<table>
<thead>
<tr>
<th>Light source</th>
<th>Wattage</th>
<th>Foam Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>Par 38 Incandescent</td>
<td>100</td>
<td>Med ccSPF</td>
</tr>
<tr>
<td>LED</td>
<td>13</td>
<td>Low ocSPF</td>
</tr>
<tr>
<td>BR40 Incandescent</td>
<td>65</td>
<td>Low ocSPF</td>
</tr>
<tr>
<td>Compact Fluorescent</td>
<td>26</td>
<td>Med ccSPF</td>
</tr>
<tr>
<td>Compact Fluorescent</td>
<td>26</td>
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<tr>
<td>LED</td>
<td>20</td>
<td>Med ccSPF</td>
</tr>
</tbody>
</table>
Luminaire mounted in a test box
~2 feet square
15 ½” deep.
Luminaires were installed to the bottom of the box to simulate an attic floor
Some adjustments were made before SPF application
ocSPF

Cover sides and top to R 30

ccSPF
LED 13 watts

ocSPF
Compact Fluorescent
26 watt

ccSPF
Compact Fluorescent  26 watt

ocSPF
Test results indicated that luminaires covered with ocSPF had temperatures similar to those obtained when tested with blown-in cellulosic insulation

\[ \sim 90^\circ C = \sim 190^\circ F \]
Luminaires with ccSPF tested with slightly higher temperatures than with blown-in cellulosic insulation
+ 3 to 5°C
CURRENT DESIGNS

Current luminaires are designed to continuously operate with external surface temperatures at or below 90°C.

While 90°C service temperatures will not ignite foam, these temperatures are above the 82°C (180°F) prolonged maximum service temperatures of SPF.
CURRENT DESIGNS

Two other concerns with current luminaire designs:

(1) Need full access to junction boxes; SPF coverage can prevent access in some designs

(2) Luminaires not evaluated for intrusion of foam; vent holes and other penetrations in current designs allow foam inside fixture
NEMA Recessed Lighting Research

Conclusions

1. NEMA agrees with current SPFA Policy to avoid spraying foam directly on luminaires.

   Currently individual NEMA luminaire manufacturers have recommendations regarding compatibility & installation practices when their luminaires may be installed with spray foam.

2. Distance of separation between SPF and luminaire is not specified
3. NEMA will be discussing possible future testing or development of luminaires designed and/or designated for use with direct contact with SPF

  a. lower operating temps (below 80C)
  b. no vent holes to prevent foam intrusion
  c. easy access of junction boxes from below
Questions?