TEST REPORT

Report Date: 07 October 2015

Project Name: Aura 135-HY/TL-66HT-N1A 6/6 Red/White DOT-C2 Conspicuity Tape

Submitted by: Aura Optical Systems
Ft. Worth, TX 76118

Test Laboratory: Calcoast – ITL
San Leandro, CA 94577

Samples Submitted: One (1) roll alternating 153 mm Red / 153 mm White, 50 mm (2 in) wide trim; submitted 11 Sep 2015

SUMMARY

Specification: FMVSS 108 / ASTM D4956-90 Type V Sheeting, Class 1 Backing

FMVSS 108 S8.2.1
S8.2.1.1 Construction .............................................Passed
S8.2.1.2 / S8.2.1.4 Pattern/Dimensions ............................Passed
S8.2.1.3 Certification Marking ....................................Passed
S8.2.1.7 / Table XVI-c Coefficient of Retroreflection .............Passed

ASTM D4956-90
7.3 Daytime Color and Luminance ...............................Passed
7.4 Accelerated Weathering ........................................Not Tested
7.5 Colorfastness ................................................Not Tested
7.6 Shrinkage ...................................................Not Tested
7.7 Flexibility ....................................................Not Tested
7.8 Liner Removal ..............................................Not Tested
7.9 Adhesion ....................................................Not Tested
7.10 Impact Resistance ........................................Not Tested
7.11 Specular Gloss ............................................Not Tested

Note: Minimum amount of sheeting required to test to ASTM D4956 is four 300 mm x 300 mm sheets.

Written by: Approved by:

Douglas G. Cummins Mark A. Evans
Photometric Engineer Laboratory Director
S8.2.1.1 Construction

Retroreflective sheeting consists of a smooth, flat, transparent exterior film with retroreflective elements embedded or suspended beneath the film so as to form a non-exposed retroreflective optical system.

S8.2.1.2 Pattern / S8.2.1.4.1 Dimensions

Reflective sheeting is made up of alternating white and red color segments of the following dimensions:

<table>
<thead>
<tr>
<th>Segment</th>
<th>Red</th>
<th>White</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>153 mm (50.0%)</td>
<td>153 mm (50.0%)</td>
<td>300 ± 150 mm</td>
</tr>
<tr>
<td>Width</td>
<td>50 mm</td>
<td>50 mm</td>
<td>50 mm (DOT-C2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>75 mm (DOT-C3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>100 mm (DOT-C4)</td>
</tr>
</tbody>
</table>

Neither white nor red sheeting shall represent more than two thirds (66.7%) of the aggregate of any continuous strip marking the width of a trailer, or any continuous or broken strip marking its length.

Samples meet Pattern/Dimension requirements.

S8.2.1.3 Certification Marking

The letters "DOT-C2" appear at least once on each white or red sheeting segment in characters at least 3 mm high or at least once every 300 mm on sheeting that is white only.

Samples meet Certification Marking requirements.
**TEST DATA SHEET**

Project Name: Aura 135-HY/TL-66HT-N1A 6/6 Red/White DOT-C2 Conspicuity Trim

### S8.2.1.7 Coefficient of Retroreflection

- **Requirement:** FMVSS 108 S8.2.1.7 / Table XVI-c
- **Test Method:** ASTM E810
  - Samples tested in four orientations (0°, 90°, 180°, and 270°)

**Sample Areas:**
- Red: 50 mm x 153 mm = 0.0077 m²

<table>
<thead>
<tr>
<th>Sample</th>
<th>Entrance Angle</th>
<th>Orientation</th>
<th>Coefficient of Retroreflection (Candela / Lux / m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.2° Obs. Angle</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Measured</td>
</tr>
<tr>
<td>Red #1</td>
<td>-4°</td>
<td>Horizontal (0°)</td>
<td>155.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (90°)</td>
<td>173.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horizontal (180°)</td>
<td>155.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (270°)</td>
<td>173.4</td>
</tr>
<tr>
<td></td>
<td>+30°</td>
<td>Horizontal (0°)</td>
<td>99.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (90°)</td>
<td>79.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horizontal (180°)</td>
<td>99.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (270°)</td>
<td>81.5</td>
</tr>
<tr>
<td></td>
<td>+45°</td>
<td>Horizontal (0°)</td>
<td>40.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (90°)</td>
<td>26.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horizontal (180°)</td>
<td>40.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (270°)</td>
<td>26.6</td>
</tr>
<tr>
<td>Red #2</td>
<td>-4°</td>
<td>Horizontal (0°)</td>
<td>145.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (90°)</td>
<td>162.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horizontal (180°)</td>
<td>146.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (270°)</td>
<td>161.9</td>
</tr>
<tr>
<td></td>
<td>+30°</td>
<td>Horizontal (0°)</td>
<td>97.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (90°)</td>
<td>76.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horizontal (180°)</td>
<td>94.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (270°)</td>
<td>73.6</td>
</tr>
<tr>
<td></td>
<td>+45°</td>
<td>Horizontal (0°)</td>
<td>40.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (90°)</td>
<td>25.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horizontal (180°)</td>
<td>38.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (270°)</td>
<td>25.6</td>
</tr>
<tr>
<td>Red #3</td>
<td>-4°</td>
<td>Horizontal (0°)</td>
<td>146.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (90°)</td>
<td>163.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horizontal (180°)</td>
<td>146.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (270°)</td>
<td>165.5</td>
</tr>
<tr>
<td></td>
<td>+30°</td>
<td>Horizontal (0°)</td>
<td>97.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (90°)</td>
<td>78.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horizontal (180°)</td>
<td>94.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (270°)</td>
<td>76.3</td>
</tr>
<tr>
<td></td>
<td>+45°</td>
<td>Horizontal (0°)</td>
<td>40.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (90°)</td>
<td>26.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horizontal (180°)</td>
<td>38.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (270°)</td>
<td>26.3</td>
</tr>
</tbody>
</table>

*Note: Red not normally mounted on vehicle in vertical orientation. Testing only for sake of thoroughness.*

Samples meet Coefficient of Retroreflection requirements.
**TEST DATA SHEET**

Project Name: Aura 135-HY/TL-66HT-N1A 6/6 Red/White DOT-C2 Conspicuity Trim

**S8.2.1.7 Coefficient of Retroreflection (continued)**

**Requirement:** FMVSS 108 S8.2.1.7 / Table XVI-c

**Test Method:** ASTM E810

Samples tested in four orientations (0°, 90°, 180°, and 270°)

**Sample Areas:**
White: 50 mm x 153 mm = 0.0077 m²

<table>
<thead>
<tr>
<th>Sample</th>
<th>Entrance Angle</th>
<th>Orientation</th>
<th>Coefficient of Retroreflection (Candela / Lux / m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.2° Obs. Angle</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Measured</td>
</tr>
<tr>
<td>White</td>
<td>-4°</td>
<td>Horizontal (0°)</td>
<td>593.9</td>
</tr>
<tr>
<td>#1</td>
<td></td>
<td>Vertical (90°)</td>
<td>693.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horizontal (180°)</td>
<td>595.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (270°)</td>
<td>691.4</td>
</tr>
<tr>
<td></td>
<td>+30°</td>
<td>Horizontal (0°)</td>
<td>417.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (90°)</td>
<td>335.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horizontal (180°)</td>
<td>403.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (270°)</td>
<td>328.3</td>
</tr>
<tr>
<td></td>
<td>+45°</td>
<td>Horizontal (0°)</td>
<td>181.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (90°)</td>
<td>119.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horizontal (180°)</td>
<td>181.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (270°)</td>
<td>114.5</td>
</tr>
<tr>
<td>White</td>
<td>-4°</td>
<td>Horizontal (0°)</td>
<td>565.5</td>
</tr>
<tr>
<td>#2</td>
<td></td>
<td>Vertical (90°)</td>
<td>650.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horizontal (180°)</td>
<td>565.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (270°)</td>
<td>649.6</td>
</tr>
<tr>
<td></td>
<td>+30°</td>
<td>Horizontal (0°)</td>
<td>419.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (90°)</td>
<td>314.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horizontal (180°)</td>
<td>392.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (270°)</td>
<td>320.2</td>
</tr>
<tr>
<td></td>
<td>+45°</td>
<td>Horizontal (0°)</td>
<td>185.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (90°)</td>
<td>115.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horizontal (180°)</td>
<td>177.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (270°)</td>
<td>117.1</td>
</tr>
<tr>
<td>White</td>
<td>-4°</td>
<td>Horizontal (0°)</td>
<td>580.6</td>
</tr>
<tr>
<td>#3</td>
<td></td>
<td>Vertical (90°)</td>
<td>676.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horizontal (180°)</td>
<td>582.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (270°)</td>
<td>681.1</td>
</tr>
<tr>
<td></td>
<td>+30°</td>
<td>Horizontal (0°)</td>
<td>414.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (90°)</td>
<td>337.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horizontal (180°)</td>
<td>399.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (270°)</td>
<td>342.8</td>
</tr>
<tr>
<td></td>
<td>+45°</td>
<td>Horizontal (0°)</td>
<td>181.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (90°)</td>
<td>120.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horizontal (180°)</td>
<td>172.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vertical (270°)</td>
<td>127.2</td>
</tr>
</tbody>
</table>

Samples meet Coefficient of Retroreflection requirements.
Project Name: Aura 135-HY/TL-66HT-N1A 6/6 Red/White DOT-C2 Conspicuity Trim

7.3 Daytime Color and Luminance

Requirement: ASTM D4956-90 Tables 8 and 10 (Type V Sheeting)
Test Method: ASTM E308, E1347, E1349, E991, E1164
(Illuminant C, 2° Observer, 45/0 Geometry)
Instrument: Hunterlab Colorflex A60 Spectrocolorimeter (No SCF available)

<table>
<thead>
<tr>
<th>Color</th>
<th>Sample</th>
<th>x</th>
<th>y</th>
<th>Measured</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>#1</td>
<td>0.6376</td>
<td>0.3364</td>
<td>5.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>#2</td>
<td>0.6451</td>
<td>0.3374</td>
<td>4.96</td>
<td>2.5</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>#3</td>
<td>0.6423</td>
<td>0.3386</td>
<td>5.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>#1</td>
<td>0.2961</td>
<td>0.3048</td>
<td>18.72</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>#2</td>
<td>0.2969</td>
<td>0.3059</td>
<td>18.94</td>
<td>15</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>#3</td>
<td>0.2962</td>
<td>0.3052</td>
<td>18.68</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Samples meet Daytime Color and Luminance requirements.

Note: Current ASTM D4956 uses D65 as illuminant instead of C.

Color Plots