



## INDUSTRIAL TESTING LABORATORY

Report No. 170426-03I3

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**TEST REPORT**

Report Date: 15 May 2017

Project Name: Aura® 196 Prismatic Fl. Orange Retroreflective Sheeting  
Batch # 30P78-2Submitted by: Aura Optical Systems  
Ft. Worth, TX 76118Test Laboratory: Calcoast - ITL  
San Leandro, CA 94577

Products Tested: Three (3) 7.9" x 8.0" panels premade by Aura

**SUMMARY**

Above samples were submitted for measurement of Coefficient of Retroreflection and Daytime Color and Luminance per ASTM D4956.

Coefficient of Retroreflection measured at entrance angles of  $-4^{\circ}$  and  $+30^{\circ}$  and observation angles of  $0.2^{\circ}$ ,  $0.5^{\circ}$ , and  $1.0^{\circ}$  without comparison to any sheeting class or reflectivity table.

Daytime Color and Luminance compared to ASTM D4956-16b Tables 2 and 11 non-Type V requirements.

Written by:

A blue ink signature of Douglas G. Cummins, written in a cursive style.

Douglas G. Cummins  
Photometric Engineer

Approved by:

A blue ink signature of Mark A. Evans, written in a cursive style.

Mark A. Evans  
Laboratory Director

**TEST DATA SHEET**

Project Name: Aura<sup>®</sup> 196 Prismatic Fl. Orange Retroreflective Sheeting  
Batch # 30P78-2

**6.2 Coefficient of Retroreflection**

Requirement: none  
Test Method: ASTM E810 - Test Distance 100 feet (30.5 m)  
Entrance angle =  $\beta_1$ .  $\beta_2 = 0$ . Observation Angle =  $\alpha$   
Projector: Hoffman GPS-102 (Illuminant A, 1.0 fc, 30" diameter)  
Sample Area: 7.9 in. x 8.0 in, 0.439 ft<sup>2</sup>

Coefficient of Retroreflection ( $R_A$ ) determined by measuring three (3) aluminum panels at two rotation angles ( $\epsilon=0^\circ$  and  $\epsilon=90^\circ$ ) and averaging.  $\epsilon=0^\circ$  arbitrarily defined as orientation with roll direction as indicated on label parallel to projector/detector half-plane (see photos).

Unknown if sampling in accordance with D4956 Section 9.1

Units: Candela per footcandle per square foot (Candela per Lux per square meter)

**0.2° Observation Angle**

Entrance Angle:		-4°				+30°			
Sample		0°	90°	Avg ( $R_A$ )	Min $R_A$	0°	90°	Avg ( $R_A$ )	Min $R_A$
196 Fl. Org	#1	221.8	192.8	207.3		95.0	96.9	96.0	
	#2	228.9	202.3	215.6		101.0	104.4	102.7	
	#3	227.0	198.5	212.8		100.9	102.5	101.7	
	Average	225.9	197.9	<b>211.9</b>	-	99.0	101.3	<b>100.1</b>	-

**0.5° Observation Angle**

Entrance Angle:		-4°				+30°			
Sample		0°	90°	Avg ( $R_A$ )	Min $R_A$	0°	90°	Avg ( $R_A$ )	Min $R_A$
196 Fl. Org	#1	102.7	122.4	112.6		58.5	55.3	56.9	
	#2	102.8	126.7	114.8		60.6	60.7	60.7	
	#3	102.6	122.7	112.7		59.2	59.0	59.1	
	Average	102.7	123.9	<b>113.3</b>	-	59.4	58.3	<b>58.9</b>	-

**1.0° Observation Angle**

Entrance Angle:		-4°				+30°			
Sample		0°	90°	Avg ( $R_A$ )	Min $R_A$	0°	90°	Avg ( $R_A$ )	Min $R_A$
196 Fl. Org	#1	28.4	29.3	28.9		17.8	17.2	17.5	
	#2	28.8	31.6	30.2		18.1	18.6	18.4	
	#3	27.8	29.0	28.4		17.4	17.4	17.4	
	Average	28.3	30.0	<b>29.2</b>	-	17.8	17.7	<b>17.8</b>	-

**TEST DATA SHEET**

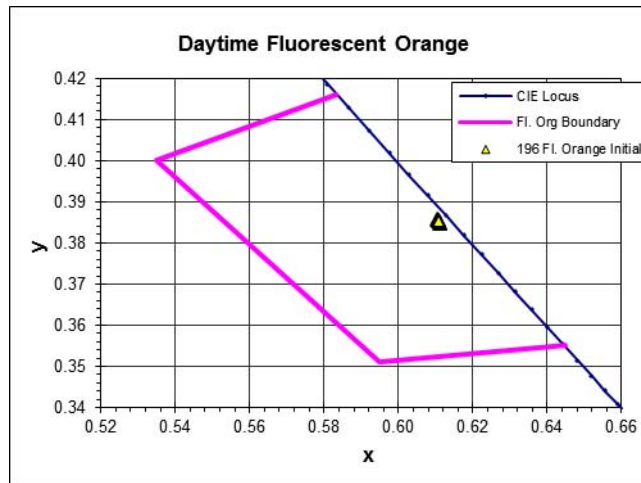
Project Name: Aura® 196 Prismatic Fl. Orange Retroreflective Sheeting  
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**6.3 Daytime Color and Luminance**

Requirement: ASTM D4956 Tables 2 and 11 (non-Type V Sheeting)  
 Test Method: ASTM E308, E1347, E1349, E991, E1164  
 (Illuminant D65, 2° Observer, Annular 45/0 Geometry)  
 Average of 8 reads, each read oriented 45° apart  
 Instrument: Hunterlab Colorflex A60 Spectrocolorimeter (No SCF available)

Product		x	y	Y		
				Measured	Minimum	Maximum
196 Fl. Orange	#1	0.6105	0.3855	44.54	20	-
	#2	0.6114	0.3847	44.44		
	#3	0.6110	0.3852	44.13		

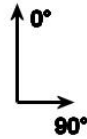
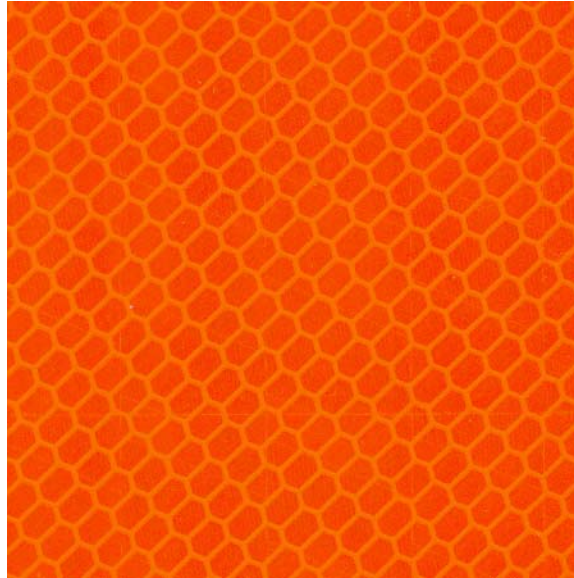
Samples meet Daytime Color and Luminance requirements.



**TEST DATA SHEET**

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**Photographs**



Sheeting Orientation