



INDUSTRIAL TESTING LABORATORY

Report No. 150507-01Br1

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TEST REPORT

Report Date: 13 July 2015

Project Name: Huangshan Xingwei XW1812EN White Hi Intensity Grade EN 12899-1 Retroreflective Sheeting

Submitted by: Huangshan Xingwei Reflectorized Material Co., Ltd. Huang Shan City, An Hui Province, China 245200

Test Laboratory: Calcoast - ITL San Leandro, CA 94577

Products Tested: XW1812EN White samples submitted 07 May 2015

SUMMARY

Specification: BS EN 12899-1:2007

Section 4 Retroreflective sign face material - 4.1 Glass bead material

- 4.1.1 Visual Performance
4.1.1.3 Daylight chromaticity and luminance factor, Class CR2 ....Passed
4.1.1.4 Coefficient of Retroreflection RA, Class RA2.....Passed
4.1.1.5 Durability
4.1.1.5.1 Resistance to weathering .....Not Tested
4.1.1.5.2 Accelerated natural weathering .....Not Tested
4.1.1.5.3 Accelerated artificial weathering .....Not Tested
4.1.2 Impact resistance .....Not Tested

Written by: Douglas G. Cummins Photometric Engineer

Approved by: Mark A. Evans Laboratory Director

**TEST DATA SHEET**

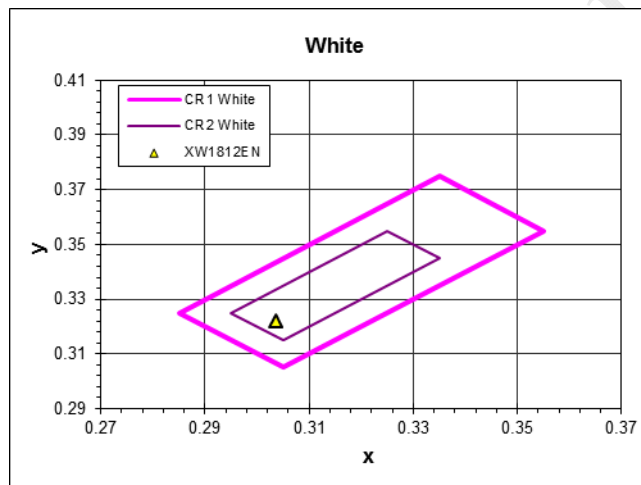
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**4.1.1.3 Daytime chromaticity and luminance**

Requirement: Table 1, Class CR1; Table 2 - Class CR2  
 Test Method: CIE 15 / 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)

Sample	x	y	$\beta$		
			Measured	Minimum	Maximum
XW1812EN White	0.3036	0.3219	0.3066	0.27	-

Samples conform to Daytime chromaticity and luminance requirements for Classes CR1 and CR2.



**TEST DATA SHEET**

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**4.1.1.4 Coefficient of retroreflection  $R_A$**

Requirement: Table 4, Class RA2  
 Test Method: CIE 54.2 / ASTM E810 - Test Distance 30.5 m ( $\beta_2 = 0$ )  
 Projector: Hoffman GPS-102 (Illuminant A, 10.7 Lux, 76 cm diameter)  
 Sample Area: 8.0 in. x 8.0 in., 0.444 ft<sup>2</sup> (203 mm x 203 mm, 0.0413 m<sup>2</sup>)

CIE 54.2 does not specify what orientation to make the retroreflective measurements. Measurements were made at orientations of  $\epsilon=0^\circ$  and  $90^\circ$ , with the  $\epsilon=0^\circ$  orientation arbitrarily chosen. The average of the samples was also reported. The material does not appear to be rotationally sensitive.

Sample	$\beta_1$	#	$\alpha: 0.20^\circ (12')$				$0.33^\circ (20')$				$2.0^\circ$			
			$0^\circ$	$90^\circ$	Avg	Min	$0^\circ$	$90^\circ$	Avg	Min	$0^\circ$	$90^\circ$	Avg	Min
XW1812EN White	5	1	318.8	318.6	318.7	250	189.4	189.3	189.4	180	5.0	5.3	5.2	5
		2	322.1	322.2	322.2		189.1	188.6	188.9		5.1	5.4	5.3	
		3	321.4	321.8	321.6		189.0	188.5	188.8		5.1	5.3	5.2	
		Avg	320.8	320.9	320.8		189.2	188.8	189.0		5.1	5.3	5.2	
	30	1	304.8	306.6	305.7	150	183.4	182.6	183.0	100	4.2	4.7	4.5	2.5
		2	314.4	310.7	312.6		185.7	182.9	184.3		4.5	4.6	4.6	
		3	313.1	309.2	311.2		185.2	182.0	183.6		4.4	4.6	4.5	
		Avg	310.8	308.8	309.8		184.8	182.5	183.6		4.4	4.6	4.5	
	40	1	272.2	276.2	274.2	110	169.3	169.3	169.3	95	3.2	3.7	3.5	1.5
		2	287.6	276.0	281.8		173.8	168.1	171.0		3.5	3.7	3.6	
		3	286.7	275.3	281.0		173.6	167.5	170.6		3.5	3.6	3.6	
		Avg	282.2	275.8	279.0		172.2	168.3	170.3		3.4	3.7	3.5	

XW1812EN White samples meet Coefficient of Retroreflection requirements for Class RA2 Sheeting.

**Photographs**

