

LumiLab

Luminance Reflectance Value (LRV) Test Report

X-Bond Microcement Finishes

22nd March 2022

LumiLab

LRV
Tests

Luminance
Contrast

Tested for:
Alternative Surfaces
329 Darebin Road
Thornbury, VIC 3071

Luminance Reflectance Value (LRV) Test Report: X-Bond Microcement Finishes

Background

Alternative Surfaces has engaged LumiLab to provide an LRV report for six different X-Bond 'microcement' finishes.

Description of Sample

Six samples have been sent to LumiLab for testing. The microcement finish has been applied by hand trowelling onto a vinyl plank material.

Each sample measured approximately 200mm x 600mm, and each ranges in thickness.

Technical Reference

This report references the following:

- Appendix B of Australian Standard (**AS**) 1428.1-2009 'Part 1: General requirements for Access - New building work' (**AS 1428.1**).
- Appendix E of AS/NZS 1428.4.1-2009 'Design for access and mobility, Part 4.1: Means to assist the orientation of people with vision impairment— Tactile ground surface indicators' (**AS/NZS 1428.4.1**).

Laboratory Testing Equipment

LumiLab uses compliant testing apparatus meeting AS 1428.1 Appendix B and AS/NZS 1428.4.1 Appendix E requirements:

- Model: Konica Minolta CR-400 tristimulus colorimeter
- Illuminating and viewing system: Diffuse illumination/0<° (d/0) viewing angle, specular component included.
- Conforms to JIS Z 8722 condition c standard
- Light source: Pulsed xenon lamp
- Measurement time: 1 second
- Minimum measurement interval: 3 seconds
- Measurement / illumination area; ∅ 8mm
- Observer: 2° Closely matches CIE 1931 Standard Observer
- Illuminant used: CIE Standard Illuminant D65
- Colour space and colorimetric data: CIE for Yxy

Testing Methodology

The following is a summary of the laboratory testing methodology, conducted in accordance with the requirements of AS 1428.1 Clause B3.3 and AS/NZS 1428.4.1 Clause E3.3:

- Lee Wilson conducted the testing on 22 March 2022.
- The apparatus was firstly calibrated in accordance with the manufacturer's instructions.
- The tristimulus value 'Y' (LRV measurements) were taken in fifteen (15) random locations in dry conditions on each of the three samples. Note – the access standards only require a minimum of five (5) samples.
- Areas of damage to each surface, dirty areas, or signs of abrasion or wear, were avoided.
- Each sample was then wetted, left for five minutes, and patted dry. The tristimulus value 'Y' (LRV measurements) were then taken in up to fifteen (15) random locations in wet conditions on each sample. This process was repeated for each sample.
- The apparatus was recalibrated between each sample test.

Definitions

The following terms are relevant to this report:

Term	Definition
Luminance contrast	The light reflected from one surface or component, compared to the light reflected from another surface or component.
LRV	Luminance reflective value
Bowman-Sapolinski equation	To determine the luminance contrast between the samples tested, the LRVs are entered into the Bowman-Sapolinski equation: $C = 125 (Y_2 - Y_1) / (Y_1 + Y_2 + 25)$, where: C = luminance contrast Y1 and Y2 = LRV of each surface

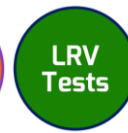
Summary

The LRVs under dry and wet conditions have been determined for each of the samples.

The average of each value is presented below:

Sample	Finish	Colour	LRV mean dry average (Y _d)	LRV mean wet average (Y _w)	LRV mean average (Y)
Sample A	X-Bond	Terra	45.36	43.64	44.50
Sample B	X-Bond	Shade	62.55	62.07	62.31
Sample C	X-Bond	Aspen	77.87	76.84	77.36
Sample D	X-Bond	Frost	71.52	71.45	71.49
Sample E	X-Bond	Haze	42.62	42.51	42.57
Sample F	X-Bond	Mist	63.97	63.66	63.81

The results of each test are provided in Appendix A.



These LRVs can be used to assess the level of luminance contrast to other surfaces.

Please contact the undersigned to discuss this report.

Yours sincerely,

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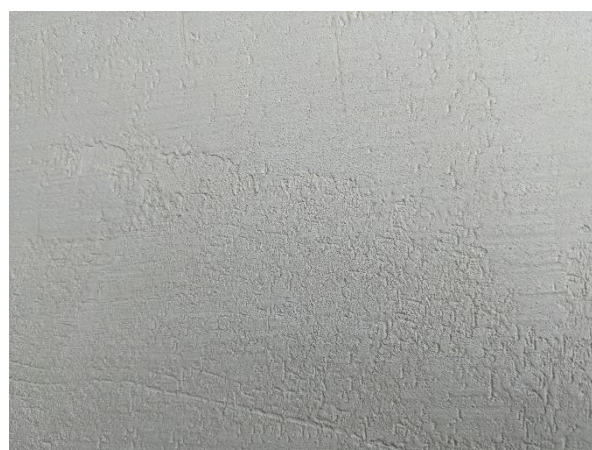
It is important to note that the material tested is subject to a wide range of surface variations, and Egress Group Pty Ltd / LumiLab cannot be held accountable or responsible for any variations in LRVs across different samples of the same material tested.

Appendix A: LRV Test Results

Photo used in this appendix are indicative only. The images are influenced by external factors (such as natural lighting and shadows). Please note that the testing methodology is specular inclusive and is not influenced by such factors.

LRV Test Results

Sample	Finish	Colour	LRV mean dry average (Yd)	LRV mean wet average (Yw)	LRV mean average (Y)
Sample A	X-Bond	Terra	45.36	43.64	44.50



The following are the test results of the tristimulus value Y (LRV):

Dry LRV Measurements (Yd)					
44.35	44.89	45.97	45.98	45.79	
45.55	46.13	44.26	44.31	45.10	
45.45	46.14	45.75	45.29	45.49	Yd 45.36

Dry LRV mean average

The Sample A LRV mean dry average is: **45.36**

Wet LRV Measurements (Yw)					
44.07	43.54	43.49	42.74	43.39	
43.62	41.98	42.48	44.25	43.42	
44.66	43.30	44.95	44.96	43.74	Yw 43.64

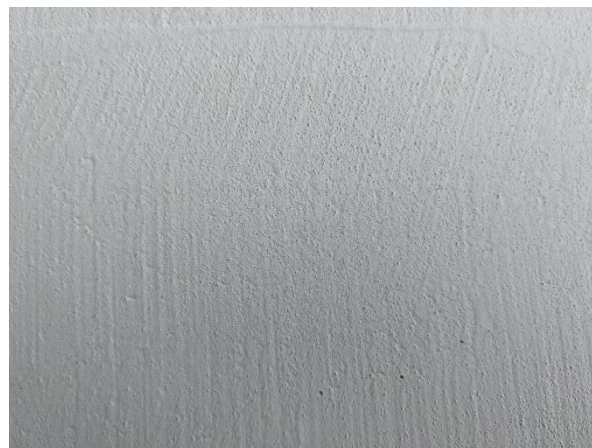
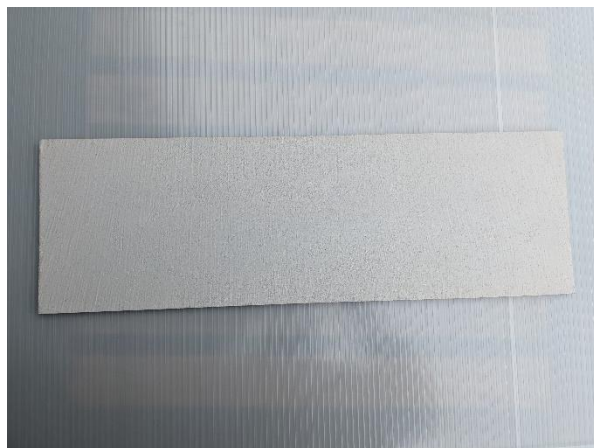
Wet LRV mean average

The Sample A LRV mean wet average is: **43.64**

The Sample A mean wet average is: **44.50**

LRV Test Results

Sample	Finish	Colour	LRV mean dry average (Yd)	LRV mean wet average (Yw)	LRV mean average (Y)
Sample B	X-Bond	Shade	62.55	62.07	62.31



The following are the test results of the tristimulus value Y (LRV):

Dry LRV Measurements (Yd)					
62.37	62.07	64.08	63.46	60.37	
62.01	61.58	61.64	63.67	63.55	
63.73	61.97	62.31	63.35	62.03	
				Yd	62.55

Dry LRV mean average

The Sample B LRV mean dry average is: **62.55**

Wet LRV Measurements (Yw)					
61.73	63.60	62.58	63.24	61.35	
62.17	61.70	62.25	61.77	61.93	
62.02	61.86	62.34	60.63	61.88	
				Yw	62.07

Wet LRV mean average

The Sample B LRV mean wet average is: **62.07**

The Sample B mean wet average is: **62.31**

LRV Test Results

Sample	Finish	Colour	LRV mean dry average (Yd)	LRV mean wet average (Yw)	LRV mean average (Y)
Sample C	X-Bond	Aspen	77.87	76.84	77.36



The following are the test results of the tristimulus value Y (LRV):

Dry LRV Measurements (Yd)					
77.84	78.80	76.86	78.62	77.71	
77.46	78.29	78.95	77.66	76.70	
76.82	78.28	77.64	78.99	77.46	
				Yd	77.87

Dry LRV mean average

The Sample C LRV mean dry average is: **77.87**

Wet LRV Measurements (Yw)					
76.45	75.56	77.01	76.84	76.15	
77.44	77.03	76.56	77.37	77.52	
77.55	77.58	77.23	76.40	75.94	
				Yw	76.84

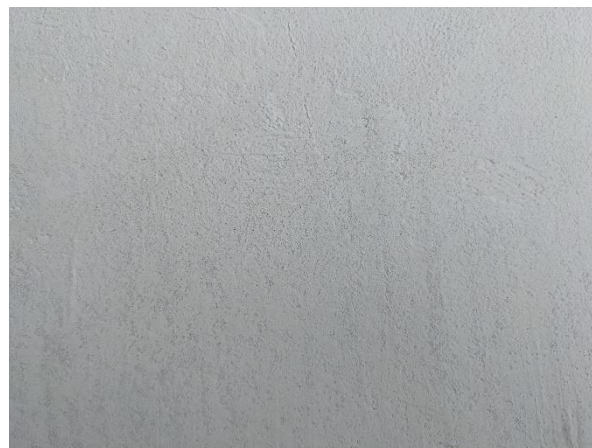
Wet LRV mean average

The Sample C LRV mean wet average is: **76.84**

The Sample C mean wet average is: **77.36**

LRV Test Results

Sample	Finish	Colour	LRV mean dry average (Yd)	LRV mean wet average (Yw)	LRV mean average (Y)
Sample D	X-Bond	Frost	71.52	71.45	71.49



The following are the test results of the tristimulus value Y (LRV):

Dry LRV Measurements (Yd)					
71.02	71.17	71.34	71.29	72.38	
71.30	72.21	72.09	70.81	69.74	
71.89	72.64	71.05	72.86	71.08	Yd 71.52

Dry LRV mean average

The Sample D LRV mean dry average is: **71.52**

Wet LRV Measurements (Yw)					
72.14	70.44	70.78	71.55	72.09	
72.03	71.29	70.68	70.47	71.53	
72.57	72.65	72.53	70.14	70.80	Yw 71.45

Wet LRV mean average

The Sample D LRV mean wet average is: **71.45**

The Sample D mean wet average is: **71.49**

LRV Test Results

Sample	Finish	Colour	LRV mean dry average (Yd)	LRV mean wet average (Yw)	LRV mean average (Y)
Sample E	X-Bond	Haze	42.62	42.51	42.57



The following are the test results of the tristimulus value Y (LRV):

Dry LRV Measurements (Yd)						
41.93	43.02	42.00	42.98	43.05		
43.50	42.14	42.99	42.43	42.20		
42.28	42.79	42.21	42.44	43.39	Yd	42.62

Dry LRV mean average

The Sample E LRV mean dry average is: **42.62**

Wet LRV Measurements (Yw)						
42.06	43.13	42.40	42.15	42.17		
42.23	42.23	43.78	43.81	42.14		
42.08	42.28	41.63	43.10		Yw	42.51

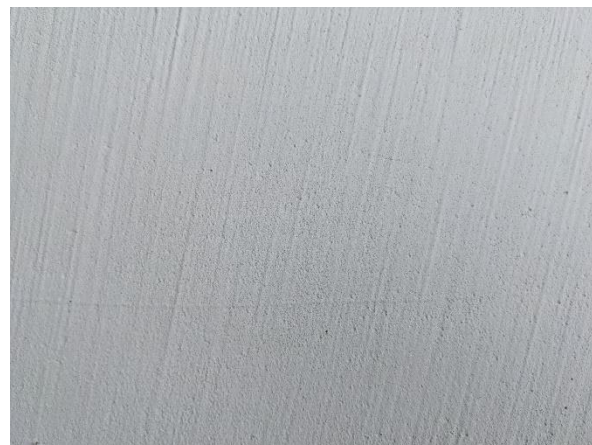
Wet LRV mean average

The Sample E LRV mean wet average is: **42.51**

The Sample E mean wet average is: **42.57**

LRV Test Results

Sample	Finish	Colour	LRV mean dry average (Yd)	LRV mean wet average (Yw)	LRV mean average (Y)
Sample F	X-Bond	Mist	63.97	63.66	63.81



The following are the test results of the tristimulus value Y (LRV):

Dry LRV Measurements (Yd)						
64.64	63.44	64.09	63.60	64.73		
63.85	64.19	63.69	63.70	64.13		
64.52	63.32	64.01	63.76	63.87	Yd	63.97

Dry LRV mean average

The Sample F LRV mean dry average is: **63.97**

Wet LRV Measurements (Yw)						
64.21	63.88	64.07	63.07	64.69		
63.95	62.59	63.36	64.45	63.05		
63.26	63.50	63.81	63.91	63.07	Yw	63.66

Wet LRV mean average

The Sample F LRV mean wet average is: **63.66**

The Sample F mean wet average is: **63.81**