

Ecoglo International Ltd

Technical Manual

for

Photoluminescent Fire Protection Signs

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Ecoglo Photoluminescent Fire Protection Signs

This specification has been numbered, organized and formatted in accordance with the MasterFormat, Section Format and Page Format documents published jointly by Construction Specifications Institute (CSI).

It is offered as a guide to experienced and knowledgeable construction professionals who assume full responsibility for its interpretation and use.

Square brackets [] containing text indicate an option to be considered/inserted by the specifier. Remove brackets and unused options before printing.

Section 10 45 00

Photoluminescent Fire Protection Signs

Part 1 General

- 1.1 Summary
 - A Work Included: Supply and installation of photoluminescent fire protection signs.
- 1.2 Quality Assurance
 - A Manufacturer Qualifications: to have minimum of 25 years' experience with similar work.
- 1.3 Submittals
 - A Submit the following [in accordance with Section 01 33 00 – Submittal Procedures]:
 - 1 Product Data: Manufacturer's product data sheets for each sign used in project.
 - 2 Manufacturer's Instructions: Pre-printed material describing installation of product, system or material, including special notices, safety data sheets outlining hazards and safety precautions and maintenance and cleaning instructions.
 - 3 Test Reports: Showing compliance with required standards, ordinances and codes.
 - 4 Substitutions: Substitutions must be submitted and approved prior to bid date. All requests shall include test results, product descriptions, confirmation of piece design and engineering calculations meeting design criteria.
- 1.4 Delivery, Storage and Handling
 - A Handle and store products in a manner to prevent damage, deterioration and soiling to products, other building components, assemblies, other products, the structure, the Site and surrounding property and in accordance with manufacturer's instructions.
 - B Store packaged or bundled products in original and undamaged containers and packaging with manufacturer's seals and labels intact. Do not remove from packaging or containers until ready to be installed.
 - C Store products subject to damage from weather in weatherproof enclosures.
- 1.5 Warranty
 - A Provide manufacturer's limited warranty. Warranty to cover defects in materials and workmanship.
 - 1 High Temperature Curing (HTC) Products:
30 Year Warranty on photoluminescent performance of HTC signs when positioned indoors.

Part 2 Products

2.1 Manufacturers

- A Contract Documents are based on products by Ecoglo International Ltd. (www.ecoglo.com)
- B Substitutions: [Under provisions of Division 01.] [Not permitted.]

2.2 Materials

- A Photoluminescent pigment embedded in thermoset polyester manufactured using a High Temperature Manufacturing (HTC) process at a temperature exceeding 160°C to integrally bond the active ingredients to 5005 0.9mm aluminium (aluminum) sheet.
- B All HTC Signs to meet or exceed the performance criteria specified in the following tests or standards. PC = Performance Criteria
 - a. UV Resistance ASTM G155-04 Cycle 1 1000hrs, Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Nonmetallic Materials. PC – Loss in luminance after exposure < 10%
 - b. Salt Spray Resistance ASTM B117-97, Standard Practice for Operating Salt Spray (Fog) Apparatus. PC – Slight corrosion build up along scribes, no blistering or filiform growth along scribes.
 - c. Washability ASTM D4828-94 (2003), Standard Test Methods for Practical Washability of Organic Coatings. PC – crayon, pen, 3M soil: all rating 10, being complete removal of soilant.
 - d. Rate of Burning ASTM D635-03, Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position. PC – Time of burn 0 seconds, does not burn.
 - e. Surface Flammability ASTM E162-02, Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source. PC – Flame spread index 7.6, ignites with difficulty.
 - f. Toxicity Bombardier Toxic Gas Generation Test SMP800-C. PC – Pass.
 - g. Radioactivity ASTM D3648-2004, Standard Practices for the Measurement of Radioactivity. PC – Pass.
 - h. Luminance
Independent luminance testing shall be undertaken as follows:
Excitation Condition (charging) – 150W Xenon lamp, 1000 lux for 5 minutes. PC – Minimum luminance of:
 - 2,000 mcd/m² after 2 minutes; and
 - 400 mcd/m² after 10 minutes; and
 - 100 mcd/m² after 30 minutes; and
 - 50 mcd/m² after 60 minutes; and
 - 20 mcd/m² after 120 minutes.
 - i. High Temperature Curing
PLC (Photoluminescent Lighting Council) Test Method to determine if a Product can be described as being an HTC (High Temperature Cured) Product. PC - no colour change, blistering or distortion.

2.3 Components

- A Basis of design: Ecoglo Photoluminescent Fire Protection Signs
 - 1 Description:
 - a. Requires not less than 54 lux of illumination continuously during

- building occupancy
 - b. Stores energy from ambient daylight, fluorescent, metal halide, mercury vapor or LED light
 - c. Non-toxic, non-radioactive
 - d. No electricity or batteries required
 - e. [Aluminium ceiling or flag mounting kit]
- B Mounting type: [Ceiling] [Flag] [Surface]

[Click here](#) to view *Ecoglo Fire Protection Signs*

Product Code	Product Name	Sign Definition	Sign Size
S5-FEXT2010	Fire Extinguisher	Fire extinguisher located here	200mm x 100mm
BR5-DS-S5-FEXT 2010	Fire Extinguisher Double Sided	Fire extinguisher located here	200mm x 100mm (each side)

Part 3 Execution

- 3.1 Examination
- A Before installation, examine surfaces on which the work of this section depends. Notify [Contractor] if substrates do not comply with requirements of this section.
 - B Do not proceed with work of this Section until all unsatisfactory conditions have been corrected, if any.
 - C Commencement of Work will imply acceptance of surfaces.
- 3.2 Preparation
- A Clean surfaces to remove dirt, dust, grease, oil, loose material, frost, paint, coatings, or other matter that may affect bonding or installation of photoluminescent products.
 - B Test substrates for fit with products before using adhesives or mechanical fastening.
- 3.3 Installation
- A Unless otherwise indicated in the specifications, install products in accordance with manufacturer's instructions. Obtain written instructions directly from manufacturer.
- 3.4 Cleaning
- A At completion of installation, clean soiled product surfaces in accordance with manufacturer's instructions.
- 3.5 Waste Management and Disposal
- A Separate waste materials for [reuse] [and] [recycling] at nearest used building materials facility.
- 3.6 Protection
- A Do not allow heavy objects to come into contact with installed products.

End of Section

Appendices to

Ecoglo International Ltd

Technical Manual

for

Photoluminescent Fire Protection Signs



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Appendix 1

Ecoglo International Ltd

Product Data Sheets



Ecoglo S5 Fire Extinguisher Sign is designed to be used in and about buildings, structures and facilities to identify the location of fire extinguishers. The sign will be readily and clearly visible along normal paths of travel, including exits.

SIGN DEFINITION

Fire extinguisher located here.

COMPLIANCE

Ecoglo S5 "Fire Extinguisher" signs meet luminance specifications of internationally accepted UL 1994 Standard for Luminous Egress Path Marking Systems.

PERFORMANCE

The signs will be operational for up to 90 minutes after failure of the main lighting provided they have been continuously illuminated by a reliable light source with a minimum of 54 lux.

Operating Temperature Range: +10°C to +30°C

Luminance – S5 grade signs easily exceed PSPA class D

UV Resistance – Loss of luminance after 1000 hrs ASTM G-155 Cycle 1 exposure: <10%

Salt Spray Resistance – ASTM B117: Pass

Washability – ASTM D4828: Pass

Rate of Burning – ASTM D635: Pass

Surface Flammability – ASTM E162: Pass

Toxicity – Bombardier Toxic Gas Generation Test SMP800-C: Pass

Radioactivity – ASTM D3648: Pass

High Temperature Curing: Pass

SUPPLY

The sign is available in one size only – see product order code below.

PRODUCT CODE	PRODUCT NAME	SIGN DEFINITION	SIGN SIZE
S5-FEXT2010	Fire Extinguisher	Fire Extinguisher located here	200mm x 100mm

COMPOSITION

The high visibility flat panel is manufactured from 5005 0.9mm aluminium sheet. Custom made photoluminescent pigments are embedded in thermoset polyester carriers to integrally bond the active ingredients onto the aluminium sheet following curing at high temperature - a process known as HTC.



INSTALLATION

For versatility the sign can be installed using fixers (screws) or double-sided adhesive tape. Please note the sign is supplied without drill holes or tape.

Note: The installation method used should be determined by the condition of the installation surface - screws should be used if there is any doubt about adhesion.

Contact

Ecoglo Fire Protection Product Trading

Address: 36-C Gloria Street, Barangay San Carlos, Binangonan Rizal 1940, Philippines

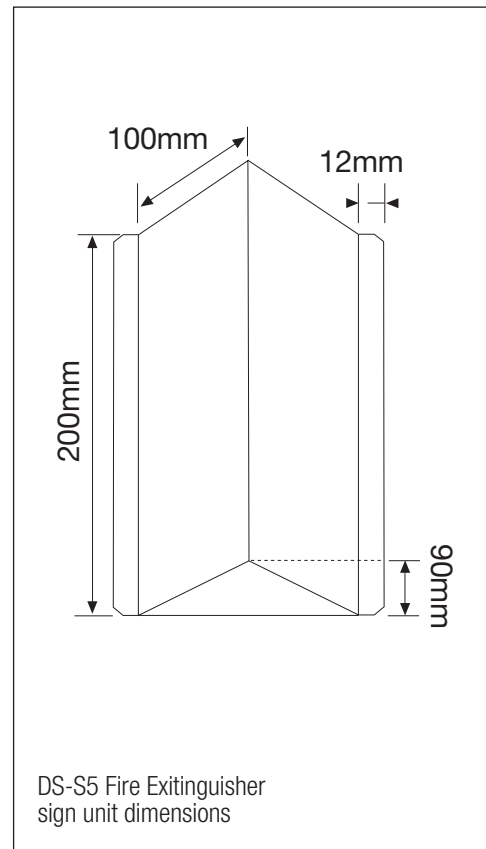
Office: +632-8802-4760

Cell: +63917-514-6803

+63968-356-4773

Email: keith.phillips@ecoglo.com

Web: www.ecoglo.ph www.EcogloAsia.com www.EcogloVenues.com



Ecoglo DS-S5 Fire Extinguisher Sign is designed to be used in and about buildings, structures and facilities to identify the location of fire extinguishers. The sign will be readily and clearly visible along normal paths of travel, including exits.

SIGN DEFINITION

Fire extinguisher located here.

COMPLIANCE

Ecoglo DS-S5 "Fire Extinguisher" signs meet luminance specifications of internationally accepted UL 1994 Standard for Luminous Egress Path Marking Systems.

PERFORMANCE

The signs will be operational for up to 90 minutes after failure of the main lighting provided they have been continuously illuminated by a reliable light source with a minimum of 54 lux.

Operating Temperature Range: +10°C to +30°C

Luminance – S5 grade signs easily exceed PSPA class D

UV Resistance – Loss of luminance after 1000 hrs ASTM G-155 Cycle 1 exposure: <10%

Salt Spray Resistance – ASTM B117: Pass

Washability – ASTM D4828: Pass

Rate of Burning – ASTM D635: Pass

Surface Flammability – ASTM E162: Pass

Toxicity – Bombardier Toxic Gas Generation Test SMP800-C: Pass

Radioactivity – ASTM D3648: Pass

High Temperature Curing: Pass

SUPPLY

The sign unit is custom made and consists of two fire extinguisher signs each 200mm x 100mm in size on a triangular mount. See product order code below.

PRODUCT CODE	PRODUCT NAME	SIGN DEFINITION	SIGN SIZE
BR5-DS-S5-FEXT2010	Fire Extinguisher	Fire Extinguisher located here	200mm x 100mm

COMPOSITION

The high visibility flat panel signs are manufactured from 5005 0.9mm aluminium sheet. Custom made photoluminescent pigments are embedded in thermoset polyester carriers to integrally bond the active ingredients onto the aluminium sheet following curing at high temperature - a process known as HTC.



INSTALLATION

Installation is a simple process using supplied fixers to flag mount the sign unit to the wall.

Contact

Ecoglo Fire Protection Product Trading

Address: 36-C Gloria Street, Barangay San Carlos, Binangonan Rizal 1940, Philippines

Office: +632-8802-4760

Cell: +63917-514-6803

+63968-356-4773

Email: keith.phillips@ecoglo.com

Web: www.ecoglo.ph www.EcogloAsia.com www.EcogloVenues.com

Appendix 2

Ecoglo International Ltd

Installation Instructions

Installation Instructions For

Signs

Surface Mounted Signs

Ecoglo exit signs are to be installed only where there will be sufficient natural or artificial light to keep them charged whenever the building is occupied.

If unsure, contact Ecoglo

Ecoglo International Limited

Email: info@ecoglo.com

Ph: +64 3 348 3781

www.ecoglo.com

Signs Surface Mounted Signs

Mounting Location

- At doors: mount on a vertical surface within 600mm of the door where the sign is least likely to be obscured from view. Where the ceiling is directly above the top of the door, the sign can be mounted on the door as long as the door is outward opening, and has a self-closer mechanism.
- On walls: mount 2 - 2.5 metres above floor level, or where it is least likely to be obscured from view.
- When installing the sign make sure it is parallel to the nearest horizontal building feature, so that it looks level to the eye.



Mounting Surfaces

- Timber: screw install (use all 4 holes in the sign).
- Plasterboard: screw install with suitable anchors (use all 4 holes in the sign).
- Glass: adhere with suitable high strength white foam back mounting tape. For signs up to 420mm x 230mm apply two strips of tape 200mm x 25mm near the top and bottom of the sign.
- Concrete, Solid plaster, Steel: adhere with Bostik Seal'N'Flex FC or Wurth KD Bond and seal, and use suitable foamback tape to ensure sign stays in position while the adhesive is curing.





Installation Instructions For
Sign Brackets

Flag and Ceiling Mounted Signs

Ecoglo exit signs are to be installed only where there will be sufficient natural or artificial light to keep them charged whenever the building is occupied.

If unsure, contact Ecoglo

Sign Brackets

Flag & Ceiling Mounted Signs

Note: For signs without pre-drilled holes, place the mounting bracket over the sign and, using the holes in the bracket, mark on the sign where the screws are to go. Remove sign and drill holes where required.

1. Assembling the Bracket



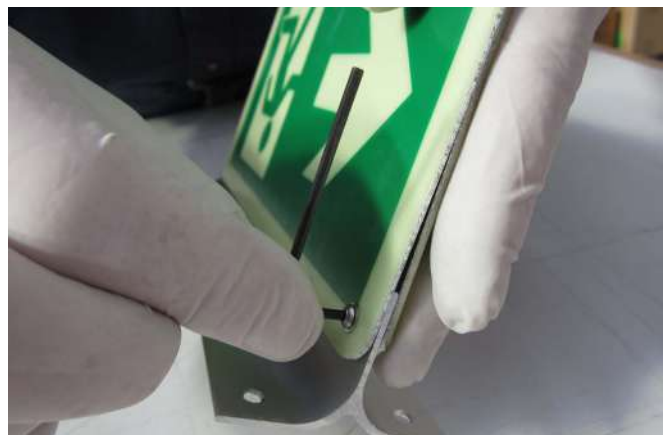
- Place a washer on screw and insert into top-left corner of first sign.



- Place a washer and nut onto screw and tighten with fingers.



- Place mounting bracket over screw.



- Using supplied Hex Key tighten the nut until flush with surface of sign.



- If required, place second sign over screw onto opposing side of bracket. Ensure the signs are facing the correct direction.



- Repeat previous steps on all corners.

Sign Brackets Flag & Ceiling Mounted Signs

2. Installing the Bracket



- Once mounting location has been decided hold flat to wall or ceiling.
- When installing the sign make sure it looks level to the eye.



- Using screwdriver or battery drill mount sign using screws provided.

Mounting Surfaces

- Mounting surfaces:
- Timber: screw install (use all 4 holes in the bracket).
- Plasterboard, Concrete, Solid plaster: screw install with suitable anchors (use all 4 holes in the bracket).
- Steel: screw or rivet install as appropriate (use all 4 holes in the bracket).



Installation Instructions For

Signs

Fire Extinguisher BR5 Tri-Mount

Ecoglo exit signs are to be installed only where there will be sufficient natural or artificial light to keep them charged whenever the building is occupied.

If unsure, contact Ecoglo

Ecoglo International Limited
Email: info@ecoglo.com
www.ecoglo.com



Installation Instructions for Signs

Fire Extinguisher BR5 Tri-Mount

1. Positioning of Signs

- Mark position on the wall where sign is to be placed.
Note: Sign should be mounted directly above fire extinguisher and in a position where it will not be obscured from view.

2. Placement of Signs

- Line the sign up with the markings you made.
- Using the fixers provided screw the sign to the wall.
- Use plastic anchors where necessary.

3. Maintenance of Signs

- Regular dusting with a soft cloth or brush is recommended to keep the sign clean.
- If the sign is noticeably dirty, clean with a sponge or cloth.

See Maintenance and Cleaning Instructions for more detailed information.



Appendix 3

Ecoglo International Ltd

Product Test Reports for Photoluminescent Fire Protection Signs

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SINCE 1886

REPORT

Intertek ETL SEMKO

3933 US ROUTE 11 CORTLAND, NEW YORK 13045

Order No. 3078911

Date: November 15, 2005

REPORT NO. 3078911CRT-008

TEST OF FOUR PHOTOLUMINESCENT MATERIAL MODELS

RENDERED TO

ECOGLO LTD.
77 KINGSLEY ROAD
CHRISTCHURCH, NEW ZEALAND 8002

DATA REQUESTED

Luminance measurements after activation tests on four photoluminescent material models after UV exposure in accordance with New York City Building Code Reference Standards RS 6-1 and RS 6-1A: Photoluminescent Low-level Exit Path Markings.

AUTHORIZATION

This test service was authorized by signed quote number 18761099.

DEVICES SUBMITTED

The client submitted three photoluminescent material samples each of four Models: G3001C/E2071C, and G5001C/H5001C. The samples were received by Intertek on June 18, 2005 in undamaged condition, and tested as received. The sample designations are E2218Z through E2223Z.

DATE OF TESTS

June 28, 2005 through November 13, 2005.

TEST SUMMARY

NYC Building Code RS 6-1A Photoluminescent Low-level Exit Path Markings	Model G3001C/E2071C	Model G5001C/H5001C
Clause 1.0 Brightnes Rating Post UV Exposure	Complies	Complies

An independent organization testing for safety, performance, and certification.

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to copy or distribute this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program. Measurement uncertainty budgets have been determined for applicable test methods and are available upon request.

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Calibration Date
Optronic Luminance Standard	455-6-2	Y174	09/30/04
Optronic based Luminance Meter consisting of:			
Optronic Photometer	730C	E290	06/23/05
Optronic Direct Viewing Module	600	---	---
Optronic Amplified Photodetector	730-5H-LED	---	---
Fisher Scientific Stopwatch	---	N853	05/05
UDT Illumination Meter	S371R	L060	09/02/04

TEST AND TEST METHODSelective Process

After evaluation at Intertek, it was determined that Models G3001C and E2071C are identical in regards to luminance performance and that Models G5001C and H5001C are identical in regards to luminance performance.

Luminance Measurements Before and After Weathering Test

The luminance measurements were made on the photoluminescent test samples with the Intertek License Plate Test Apparatus. The center of each test sample was measured at normal (0°) viewing angle. The aperture of the Optronic based luminance meter was adjusted in order to view the maximum area on the test sample. The Intertek License Plate Test Apparatus consists of a Optronic based luminance meter and a horizontal and vertical movement system. The luminance calibration of the luminance meter is traceable to the National Institute of Standards and Technology through the calibration of the Optronic Luminance Standard.

The test samples were conditioned for at least 16 hours at zero footcandle illumination. The photoluminescent material samples were then conditioned for 120 minutes (two hours) by 2 footcandle illumination from a 4100K fluorescent light source. Luminance measurements were made on each test sample at two minutes intervals after conditioning for a period of one hour and at ninety minutes after conditioning. Luminance measurements were reported for ten minutes, sixty minutes and ninety minutes after conditioning.

Weathering Tests

The test samples were sent to Canesis Network Limited for 1000 hours exposure to Xenon Arc light apparatus per ASTM G155 Cycle 1. The samples were returned to Intertek for the post UV luminance measurements. Average post UV luminance measurements must be at least 90% of the initial average luminance measurements at each time interval.

Checked by: 

RESULTS OF TESTLuminance Measurements After Two Hours Activation Period

Model No. G5001C/H5001C
Intertek Sample Nos. E2220Z, E2218Z, E2219Z

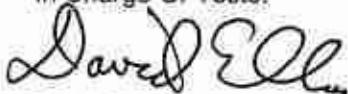
Time After Exposure	Luminance (mcd/m ²)			Average	Specified Minimum
	Sample One	Sample Two	Sample Three		
<u>Pre UV Exposure</u>					
Ten Minutes	41.1	40.8	42.3	41.4	30
One Hour	9.96	9.66	10.25	9.96	7.0
Ninety Minutes	6.56	6.37	6.78	6.57	5.0
<u>Post UV Exposure</u>					
Ten Minutes	37.6	37.5	36.9	37.3	37.3*
One Hour	10.09	9.54	10.19	9.94	8.96*
Ninety Minutes	6.97	6.41	7.02	6.80	5.91*

Model No. G3001C/E2071C
Intertek Sample Nos. E2222Z, E2221Z, E2223Z

Time After Exposure	Luminance (mcd/m ²)			Average	Specified Minimum
	Sample One	Sample Two	Sample Three		
<u>Pre UV Exposure</u>					
Ten Minutes	105.6	104.7	107.3	105.9	30
One Hour	29.0	28.5	29.2	28.9	7.0
Ninety Minutes	20.2	19.7	20.1	20.0	5.0
<u>Post UV Exposure</u>					
Ten Minutes	99.1	97.2	100.0	98.8	95.3*
One Hour	27.3	28.4	27.6	27.8	26.0*
Ninety Minutes	18.1	19.4	18.4	18.6	18.0*

* Specified minimum is 90% of average initial luminance value at each time interval

In Charge Of Tests:



David Ellis
Project Engineer
Photometric Testing

Report Reviewed By:



Ernest Dykeman
Senior Project Engineer
Photometric Testing

Attachment: None



Scientific Services
Laboratory

Report No: XC2278/R1

TEST REPORT
SALT SPRAY TESTING OF STAIR NOSING

File: BPB/MISC

1. SAMPLE DETAILS

Client: Delwyn Ralston
LincLab Ltd
Private Bag 4749
Christchurch New Zealand

Sample Details: Five samples of aluminium stair nosings with anti-slip and photoluminescence inserts.

Requirements: To determine the salt spray resistance on the stair nosing.

2 TEST DETAILS-NATA REGISTRATION 219

2.1 Salt Spray

The samples were exposed in a Singleton Model 21 Salt Spray Cabinet for 500 hours. A second sample of 120201 J was kept as a reference sample. The salt spray testing was carried out in accordance with ASTM B117-97 'Standard Test Method of Salt Spray (Fog) Testing'.

2.2 Evaluation

After exposure, the samples were evaluated in accordance with ASTM D1654-92 'Evaluation of Painted or Coated Specimens Subject to Corrosive Environment'. The degree of corrosion was determined in accordance with ASTM D610. The anti-slip properties were assessed visually at 10 x magnification. The photoluminescence of the exposed samples was compared with that of the reference sample in a dark room.

3 RESULTS

Sample No	XC 2278/F	XC 2278/G	XC 2278/H	XC 2278/I	XC 2278/J
Details	Aluminium stair nosing Labelled 120201F	Aluminium stair nosing Labelled 120201G	Aluminium stair nosing Labelled 120201H	Aluminium stair nosing Labelled 120201I	Aluminium stair nosing Labelled 120201J
Degree of Corrosion	0.5 % (Rating 9)	0.3 % (Rating 9)	0.3 % (Rating 9)	0.2 % (Rating 9)	0.2 % (Rating 9)
Anti Slip Properties	No deterioration observed	No deterioration observed	No deterioration observed	No deterioration observed	No deterioration observed
Photo - luminescence	No deterioration observed	No deterioration observed	No deterioration observed	No deterioration observed	No deterioration observed

G. Eccleston

G Eccleston
Senior Materials Scientist
9 April 2001



NATA Endorsed Test Report
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177 Salmon St, Port Melbourne, Vic, 3207 Telephone (03) 9248 4900 Fax (03) 9646 5165
A Business Unit of the Australian Government Analytical Laboratories (AGAL)
Industry, Science and Resources



TEST REPORT

DATE: 07/07/2005

TEST NUMBER: 096346

CLIENT	Ecoglo Ltd
--------	------------

TEST METHOD CONDUCTED	ASTM D4828 Washability of Organic Materials
-----------------------	---

DESCRIPTION OF TEST SAMPLE	
IDENTIFICATION	E2071
COLOR	Photoluminescent
ROLL	-----
CONSTRUCTION	-----
FIBER	-----
BACKING	-----
REFERENCE	

GENERAL PRINCIPLE

This test method covers the determination of the relative ease of removal of common soil and stains from interior coatings. The stains used in this procedure include: crayon, pen, lipstick, and 3M soil. The soilants are applied to the material and are subsequently removed manually using a sponge and liquid cleaner. The area stained is rated for color change and the number of cleaning cycles reported at the point of complete removal. Three replicates of each stain were applied with the results reported as the average of all three ratings.

TEST RESULTS

	Crayon	Felt Tip Pen	Lipstick	3M soil
Gloss Change	None	None	None	None
Color Change	None	None	None	None
Erosion	None	None	None	None
Cycles to Clean	74	7	31	14
Rating	10	10	10	10

NOTE: This sample **PASSES** the requirements as listed in the New York Department of Buildings RS6-1A section 6-1A 2.0

APPROVED BY:

This report is provided for the exclusive use of the client to whom it is addressed. It may be used in its entirety to gain product acceptance from duly constituted authorities. This report applies only to those samples tested and is not necessarily indicative of apparently identical or similar products. This report, or the name of Professional Testing Laboratory Inc. shall not be used under any circumstance in advertising to the general public.



TEST REPORT

DATE: 07/07/2005

TEST NUMBER: 096346

CLIENT	Ecoglo Ltd
--------	------------

TEST METHOD CONDUCTED	ASTM D635 Standard Test Method for Rate of Burning and or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position
-----------------------	---

DESCRIPTION OF TEST SAMPLE	
IDENTIFICATION	E2071
COLOR	Photoluminescent
ROLL	-----
CONSTRUCTION	-----
FIBER	-----
BACKING	-----
REFERENCE	

GENERAL PRINCIPLE

This method covers a small scale procedure for comparing the relative rate of burning and the extent and time of burning of self-supporting plastics that are tested in the horizontal position. A bar of the material is supported at one end. The free end is exposed to a gas flame for 30 seconds. The time and extent of burning are measured and reported. An average burn rate is reported over ten test specimens.

TEST RESULTS

	Burn Rate	Time of Burn	Extent of Burn
Specimen 1	No Burn Rate	0 Seconds	Did Not Ignite
Specimen 2	No Burn Rate	0 Seconds	Did Not Ignite
Specimen 3	No Burn Rate	0 Seconds	Did Not Ignite
Specimen 4	No Burn Rate	0 Seconds	Did Not Ignite
Specimen 5	No Burn Rate	0 Seconds	Did Not Ignite
Specimen 6	No Burn Rate	0 Seconds	Did Not Ignite
Specimen 7	No Burn Rate	0 Seconds	Did Not Ignite
Specimen 8	No Burn Rate	0 Seconds	Did Not Ignite
Specimen 9	No Burn Rate	0 Seconds	Did Not Ignite
Specimen 10	No Burn Rate	0 Seconds	Did Not Ignite
Average	No Burn Rate	0 Seconds	Did Not Ignite

APPROVED BY:

This report is provided for the exclusive use of the client to whom it is addressed. It may be used in its entirety to gain product acceptance from duly constituted authorities. This report applies only to those samples tested and is not necessarily indicative of apparently identical of similar products. This report, or the name of Professional Testing Laboratory Inc. shall not be used under any circumstance in advertising to the general public.

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JALITE USA P. O. No. APR 15 of APRIL 15, 2005

DIVISION OF ELECTRONIC MEASUREMENTS AND DEVICES

Page 1 of 2

TEST REPORT
 NO. 850850821B of 20 MAY 2005

BRIGHTNESS, RADIOACTIVITY AND FLAME SPREAD TEST

Table 1. LUMINANCE TEST (Contact Method)

No.	Sample	Tested Area Geometry		Excitation		Luminance (Brightness), mcd/m ² after the time period of		
		Diameter mm	Area cm ²	Duration min	Illuminance lx	10 min	60 min	90 min
1	Ecoglo-G3001c	56.39	25.0	120.0	21.63	111	28.8	19.7

CONCLUSION: 1. *The tested samples of Ecoglo-G3001c meet the requirements of NYC Building Code Ref. STD RS 6-1, para. 1.4.*
 2. *The material tested has the Brightness Rating of 111-29-20.*

Table 2. RADIOACTIVITY TEST

No.	Material	Test Result, μSv/hr			Comments
		α-count	β-count	γ-count	
1 radioactive	Ecoglo-G3001c	<0.01	<0.01	<0.01	Non-

CONCLUSION: *The tested samples of Ecoglo-G3001c meet the requirements of NYC Building Code Ref. STD RS 6-1, para. 4.2.*

(continued on page 2)

3. FLAME SPREAD TEST

No.	Material	Test Parameters		Flame Spread	Flame Spread	Comments
		Temperature Drop $\Delta T, K$	Spec. Temperature Rise, $\beta, K/kW$	Factor, F_s 1	Index, I_s 1	
1	Ecoglo-G3001c	21.5	31.4	1.51	7.59	Ignites with difficulties

CONCLUSION: *The tested samples of Ecoglo-G3001c meet the requirements of NYC Building Code Ref STD RS 6-1, para. 5.2.*

TEST DESCRIPTION

- The test per ISO 17398:2000, Clause 7.11 and NYC BC Ref. STD RS-1, para. 1.1 - 1.4 (brightness); ASTM D3648 and NYC BC Ref. STD RS-1, para. 4.1 - 4.2 (radioactivity); and ASTM E162 and NYC BC Ref. STD RS 6-1, para. 5.1 - 5.2 (flame spread). Test conditions: T=22°C, RH=47±2%, P=101.0±0.2 kPa.
- The samples were preconditioned for the luminance test in the dark chamber and being wrapped in the black photographic paper for 63 hours, and were removed from the chamber immediately before the test. The test was performed in the windowless room lighted with the red photo-processing light. The excitation fluorescent light source has the maximum equivalent radiation intensity of $1.94 \cdot 10^7 \text{ W/m}^2$ ($4.3 \cdot 10^3 \text{ K}$) with $\lambda_{\text{max}}=674 \text{ nm}$.
- The radiation intensity readings were taken at nine different points on the surface of each of the samples tested with the samples located inside and outside of the radiation insulation chamber and under twelve angles between the normal to the sample surface and the direction of the field of gravity. The data in Table 2 were processed to exclude both the cosmic and the earth radiation background noise.
- The experimental error evaluated by the partial derivatives and least squares methods does not exceed 5%, 4% and 6.5% for the luminance, radioactivity and flame spread measurements, respectively. The data on the standard deviation are kept on file at CIEMS.

5. INSTRUMENTS AND DEVICES USED

- Digital Photometer Model 840006 SSL (0 to 20,000 lx), Digital Scotopic/Photopic Meter Model SL-3101 SLC
- Radiometer/Photometer Model DR-2000 w/Si Detector GS
- Goniometer Model 3501-08 FD
- Moseley X-Y Recorder Model 7035B HP
- 50A, 6V Stabilized Power Supply Model SC-506FAVD HBC
- Precision Micrometer Model 25/100 Krupp/Hommelwerke
- Radiation Pyrometer Model ST-30 Raynger
- Digital Timer Model Labchron-1402 LLI
- Programmed Temperature/Humidity Controller Model 100
- Geiger-Mueller Counter Model SGM-49C PRI

(continued on page 3)

- Scintillator Counter Model 111 PRI
 - Digital Nuclear Radiation Monitor Model DX-1 ITS
 - Flame Spread Testing Device Model 394-19DI BD
 - Digital Pyrometer Model Metis-MP25 SensorTherm GmbH (100°C - 700°C, 2.0 µm - 2.8 µm)
 - Optical Pyrometer Model MX-2 Raytek
 - IR Thermometer Model IR550 DKS
 - Precision Potentiometer/Thermometer Model 8659-AZ L&N
 - Microscopes: Model 9700 TSC, Model 500 PH, Model Tukon-300 Wilson
 - Starrett Dial Indicator Model 25-109 (1.27 µm/div)
 - Digital Hydrothermometer Model 63-844 MI, Barometer Model 602650 SB.
6. Reference materials used for the test setup calibration:
- NIST SRM 4233C (Cs-137-Ba-137m) - for the radiation measurements
 - NIST SRM 1002d ($I_s=153$, $Q=36.5$) - for the flame spread test.
7. The equipment used in the test meets the applicable NIST, ASTM, ASME, OSHA and State requirements and was calibrated with the standards traceable to the NIST. The calibration was performed per ANSI/ISO ASQ Q9004-2000, ISO 10012-1:1992, ISO 10012-2:1997, MIL-STD-45662, MIL-I-45208, NAVAIR-17-35-MTL-1, CSP-1/03-93 and the instruments manufacturers' specifications.
8. The equipment passed a periodic accuracy test in June 2004. The linear and volume measure instruments and equipment were calibrated in December 2004. Next test - June 2005.

TEST ENGINEER: 51

DIVISION MANAGER: *Cynthia Smythe*

Bombardier SMP 800-C Toxic Gas Generation of "Ecoglo S10 Photoluminescent Sheet"

A Report To: **Ecoglo International Ltd.**
Unit 3, 160 Ferry Road
Waltham, Christchurch 8011
New Zealand

Phone: +64 3 3483781

Attention: Delwyn Ralston
E-mail: delwynralston@ecoglo.com

Submitted by: Element Fire Testing

Report No. 23-002-408(A)
3 Pages + Appendix

Date: November 15, 2023

1.0 ACCREDITATION

ISO/IEC 17025 for a defined Scope of Testing by the American Association for Laboratory Accreditation (A2LA), Certificate Number: 6524.03.

2.0 SPECIFICATIONS OF ORDER

Determine toxic gas production according to Bombardier SMP 800-C, as per Ecoglo International Ltd. Reference Purchase Order Number EGI-PO0004179-1 and Element Quotation No. 23-002-478134 R1 dated August 18, 2023.

2.1 History of Revision

This is the original.

3.0 SAMPLE IDENTIFICATION (Element sample identification number: 23-002-S0408)

Photoluminescent sheet material, described as: "Photoluminescent material thermally bonded to aluminium sheet" and identified as:

"Ecoglo S10 Photoluminescent Sheet"

4.0 SUMMARY OF TEST PROCEDURE

Specimens are exposed to the combustion conditions described in ASTM E 662 - *Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials*. Testing is performed in each of the flaming and non-flaming modes. For each mode, an established volume of the smoke generated by those tests is then separately sampled (drawn) from the chamber at specific flow rates, through infrared analyzers (for carbon monoxide and carbon dioxide), and through liquid chemical impingers designed to trap the other target gas species. These specific gases are recognized as the primary toxicants and irritants that can be found in the products of combustion for many material fires. Each impinger solution is then further analyzed using an ion chromatograph, or other appropriate analytical techniques, in order to determine the relative concentration of each of the targeted gas species that were collected from the sampled volume of gas. Results are then compared for acceptance against established threshold or critical concentration criteria for each species.

5.0 TEST RESULTS

Bombardier SMP 800-C Rev. 6 (2009-08-31)

Toxic Gas Generation

Date of Material Receipt	2023-10-23			
Date of Test	2023-11-02			
Carbon Monoxide (CO ppm)	Flaming Mode	Non-Flaming Mode	Specified Maxima	Result
at maximum:	326	12	3500	Pass
Carbon Dioxide (CO ₂ ppm)	Flaming Mode	Non-Flaming Mode	Specified Maxima	Result
at maximum:	19304	<10	90000	Pass

Bombardier SMP 800-C Rev. 6 (2009-08-31)

Toxic Gas Generation

Other Gases Sampled	Flaming Mode	Non-Flaming Mode	Specified Maxima	Result
Nitrogen Oxides (as NO ₂ ppm)	6	<1	100	Pass
Sulfur Dioxide (SO ₂ ppm)	<1	<1	100	Pass
Hydrogen Chloride (HCl ppm)	12	7	500	Pass
Hydrogen Fluoride (HF ppm)	<2	<2	100	Pass
Hydrogen Bromide (HBr ppm)	<0.5	<0.5	100	Pass
Hydrogen Cyanide (HCN ppm)	1	<1	100	Pass

Additional Information	Flaming Mode	Non-Flaming Mode	Specified Maxima	Result
Original Weight (g)	21.09	21.12	-	-
Final Weight (g)	17.75	20.98	-	-
Weight Loss (g)	3.34	0.14	-	-
Weight Loss (%)	15.8	0.7	-	-

Time to Ignition (s)	60	Did not ignite	-	-
Burning Duration (s)	250	-	-	-

6.0 CONCLUSIONS

The high-performance photoluminescent (HPPL) material identified in this report, meets the Bombardier requirements as they pertain to toxic gas production (Bombardier SMP 800-C).



Mel Garces,
Senior Technologist.



Ian Smith,
Technical Manager.

Note: This report is related only to the sample identified and shall not be reproduced, except in full, without approval. It is covered under Element Materials Technology Canada Inc. Standard Terms and Conditions of Contract, which is accessible at www.element.com, or by calling 1-866-263-9268. Direct readings reported form the basis for acceptance or rejection (pass/fail) and do not take into account or incorporate uncertainty

A.0 APPENDIX

A.1 Bombardier SMP 800-C Rev. 6 (2009-08-31) Toxic Gas Sampling and Analytical Procedures

A.1.1 Toxic Gas Generation

Gases produced for analysis are generated in a specified, calibrated smoke chamber during standard rate of smoke generation testing (typically ASTM E 662), in both flaming combustion and non-flaming pyrolytic decomposition test modes.

A.1.2 Carbon Monoxide (CO) and Carbon Dioxide (CO₂)

CO and CO₂ are monitored continuously during the 20 minute test using a non-dispersive infrared (NDIR) analyzer. Data are reported in ppm by volume at 1.5 and 4.0 minutes and at maximum concentration.

A.1.3 Acid Gas Sampling

HCN, HF, HCl, HBr, NO_x and SO₂ are sampled by drawing 6 litres of the chamber atmosphere through two midjet impingers, each containing 10 ml of 0.25N NaOH, at a rate of 375 ml per minute. The 16 minute sampling period is commenced at the 4 minute mark. All determinations are performed in both the flaming and non-flaming modes and all data are reported in parts per million (ppm) by volume in air.

A.1.4 Analysis of Impingers for Hydrogen Cyanide (HCN)

Cyanide in the NaOH impinger, as NaCN, is converted to CNCl by reaction with chloramine-T at pH greater than 8 without hydrolyzing to CNO⁻. After the reaction is complete, CNCl forms a red-blue colour on addition of a pyridine-barbituric acid reagent. Cyanide is quantified by spectrometric measurement of the increase in colour 578 nm. Reference: Element SOP 00-13-SP-1216 based on ASTM Method D 2036-91

A.1.5 Analysis of Impingers for Hydrogen Fluoride (HF)

Fluoride, as NaF, in the NaOH impinger is determined using SPADNS colorimetry.

Reference: Element SOP 01-13-SP-1295

A.1.6 Analysis of Impingers for Hydrogen Chloride (HCl) and Hydrogen Bromide (HBr)

Alkali halides (chloride and bromide) formed in the NaOH solution are measured using ion chromatography and conductivity detection. Reference: Element SOP 02-13-SP-1402

A.1.7 Analysis of Impingers for Nitrogen Oxides (NO_x)

Nitrite and nitrate formed in the alkaline solution are determined using ion chromatography and conductivity detection. The nitrite and nitrate results are combined and the total expressed as nitrogen dioxide (NO₂).

Reference: Element SOP 02-13-SP-1402

A.1.8 Analysis of Impingers for Sulfur Dioxide (SO₂)

SO₂ is trapped in the NaOH impinger as sulfite and sulfate (SO₃⁻² and SO₄⁻²). Hydrogen peroxide is added to convert SO₃⁻² to SO₄⁻². Resulting sulfate is determined using ion chromatography and conductivity detection. Reference: Element SOP 02-13-SP-1402



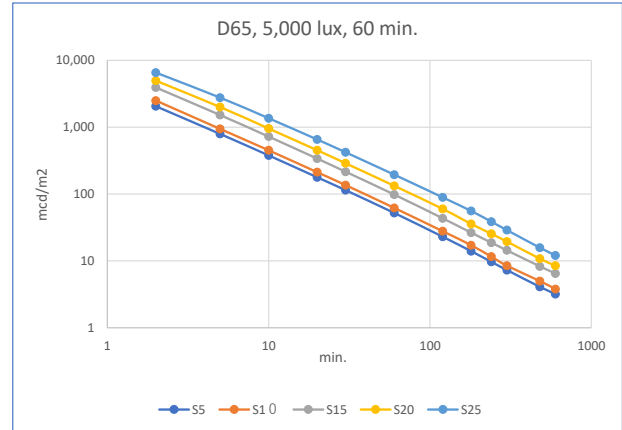
Brightness Analysis of Photoluminescent Rigid Sheet Manufactured by Ecoglo International Ltd.

Reporting date: September 26, 2018

Analyzer: Topcon BM-5AS
 Excitation Source: TOSHIBA 20W Fluorescent Lamp FL20S-D-EDL-D65
 Excitation Condition: D65 5,000 lux, 60 minutes

(mcd/m²)

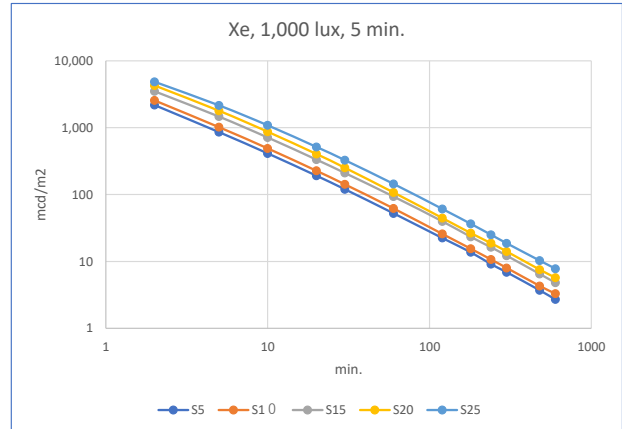
Time after removal of ex. (min.)	S5	S10	S15	S20	S25
2	2,058	2,504	3,930	4,971	6,556
5	794	944	1,522	2,006	2,772
10	379	452	725	956	1,362
20	178	212	339	453	656
30	114	136	216	289	422
60	52.3	62.2	98.5	132.9	195.3
120	23.0	27.8	43.4	60.0	89.2
180	14.0	17.2	26.5	35.8	55.9
240	9.7	11.6	18.8	25.5	38.7
300	7.3	8.5	14.4	19.5	28.9
480	4.1	5.0	8.3	10.8	15.8
600	3.2	3.8	6.5	8.5	12.1



Analyzer: Topcon BM-5AS
 Excitation Source: Hamamatsu Photonics 150W Xenon lamp L2175
 Excitation Condition: Xe 1,000 lux, 5 minutes

(mcd/m²)

Time after removal of ex. (min.)	S5	S10	S15	S20	S25
2	2,179	2,559	3,505	4,284	4,861
5	860	1,019	1,468	1,794	2,160
10	413	491	714	871	1,087
20	192	227	334	405	517
30	120	142	210	252	327
60	52.4	62.0	93.4	107.5	144.4
120	22.4	25.8	39.8	44.6	61.1
180	13.7	15.5	23.3	26.6	36.5
240	9.1	10.7	16.3	18.8	25.1
300	6.9	8.0	12.2	14.1	18.7
480	3.7	4.3	6.5	7.5	10.3
600	2.7	3.3	4.8	5.7	7.8





Allunga Exposure Laboratory

DURABILITY

Tel: + 61 7 4778 1697
Fax: +61 7 4422 0009
Lat 19°S, 147°E

Email: test@allunga.com.au
Web: www.allunga.com.au

Mail: Locked Bag 369, Aitkenvale
Mail Centre, Queensland,
AUSTRALIA 4814

Attention Delwyn Ralston
Ecoglo International Ltd
77 Kingsley St
Sydenham Christchurch 8023
New Zealand

Report Name Samples / 1-6 @ 20 min @ 150°C
Duration 20 min @ 150°C
Your Reference Samples / 1-6
Our Reference 20D06WW1-6
Report Date 07-Apr-2020

Exposure Type: See Below
Date Exposed 06-Apr-2020

Book & Page: 909/66
Site: Townsville (Main)

Authorised AEL Signatory: Chris Cooper

Notes:

EXPOSURE

Expose samples for 20 minutes at 150°C, as per client instructions.

Instrument: WiseVen WOF-105 Precision Laboratory Oven.

REPORT STANDARDS

VISUAL ASSESSMENT OF CHANGE

Based on Standard: AS/NZS 1580.481.1:1998 Coatings Exposed to Weathering (12 Parameters of Change)

Degree of colour change - AS/NZS 1580.481.1.12

Degree of Blistering - AS/NZS 1580.481.1.9 Blistering

Degree of distortion/shrinkage

AS/NZS, ISO Rating scale: 0-5. 0 = No change, 5 = Complete change

NOTE: AS/NZS 1580.481.1.9 Degree of Blistering

Rating is in two parts, Density (D) and Size (S)

Method 481.1.1.9: Degree of Blistering

0 = None

1 = Less than few

2 = Few

3 = Medium

4 = Medium-dense

5 = Dense

Note: Report prepared >24 Hours post exposure to allow any colour changes associated with energy absorption/radiation to dissipate. Photos taken at 45 minutes and at 24 hours.

Exposure conducted: 06 April 2020.

Report Prepared: 07 April 2020.

Evaluation based on As 1580.481

1.1	General Appearance
1.2	Discolouration
1.3	Dirt Collection
1.4	Dirt Retention
1.5	Change of Gloss
1.6 (E)	Erosion
1.7 (F)	Checking
1.8 (G)	Cracking

1.9 (J)	Blistering
(K)	Visible Rusting
1.11 (L)	Chalking
1.13	Mould, Algae, Fungus
FIC	Ford Image Clarity
FD	Film Defects
d	Darker
l	lighter

Colour: D65/10

All Samples Tested As Received

b	bluer
y	yellow
g	greyer
wh	whiter
f	fade
i	increase
c	continued
t	trace

length measurements in mm

m	includes mould
loc	localized
nnc	no noticeable change
sd	surface distortion
ws	water spotting
af	adhesion failure
S	slight
sv	severe



Allunga Exposure Laboratory

DURABILITY

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Fax: +61 7 4422 0009
Lat 19°S, 147°E

Email: test@allunga.com.au
Web: www.allunga.com.au

Mail: Locked Bag 369, Aitkenvale
Mail Centre, Queensland,
AUSTRALIA 4814

Attention Delwyn Ralston
Ecoglo International Ltd
77 Kingsley St
Sydenham Christchurch 8023
New Zealand

Report Name Samples / 1-6 @ 20 min @ 150°C
Duration 20 min @ 150°C
Your Reference Samples / 1-6
Our Reference 20D06WW1-6
Report Date 07-Apr-2020

Exposure Type: See Below
Date Exposed 06-Apr-2020

Book & Page: 909/66
Site: Townsville (Main)

Authorised AEL Signatory: Chris Cooper

Client Ref	Colour Change	Blistering	Distortion
Hazard tape	0 t	0	1-2
G3-001	0	0	0
S5 sign (1)	0	0	0
S5 sign (2)	0	0	0
S20	0	0	0
A20	1 d g	-	5

Client Ref.	Comments
Hazard tape	Tape has an 'orange peel' wrinkling across whole surface. See photographs
A20	Sample melted onto substrate trapping air in small voids that subsequently expanded giving appearance of blistering, substrate distorted as sample cooled. Exposed material appears a trace darker and greener 24 hours after exposure. See photographs.

Evaluation based on As 1580.481

1.1 General Appearance
1.2 Discolouration
1.3 Dirt Collection
1.4 Dirt Retention
1.5 Change of Gloss
1.6 (E) Erosion
1.7 (F) Checking
1.8 (G) Cracking
1.9 (H) Flaking & Peeling

1.9 (J) Blistering
(K) Visible Rusting
1.11 (L) Chalking
1.13 Mould, Algae, Fungus
FIC Ford Image Clarity
FD Film Defects
d Darker
l lighter
r redder

Colour: D65/10

All Samples Tested As Received

b bluer
y yellower
g greyer
wh whiter
f fade
i increase
c continued
w wide variation
t trace

length measurements in mm

m includes mould
loc localized
nnc no noticeable change
sd surface distortion
ws water spotting
af adhesion failure
S slight
md moderate
sv severe

Appendix 4

Ecoglo International Ltd

Safety Data Sheet

1. Identification

Product Name

Ecoglo S5 Flat Panel Signs including: S5-RML1010, S5-RMR1010, S5-ARS1010, S5-ARD1010, S5-SI4631, S5-DHM1010, S5-EX230120, S5-EX290155, S5-EXR230120, S5-EXR290155, S5-EXL230120, S5-EXL290155, S5-EXRL310166, S5-RMLFE-228102, S5-RMRFE-228102, S5-SU228102, S5-SD228102, S5-FEXT228102, S5-EVAC210297, S5-EVAC216280, S5-EVAC216330, S5-EVAC457610, S5-EVAC610915, S5-FEXT2010, S5-FH1010, S5-FA1010, S5-BG1010, S5-FEGL2010, S5-RM2010, S5-RMUA2010, S5-RMDA2010, S5-RML2010, S5-RMR2010, S5-RMUL2010, S5-RMDL2010, S5-RMUR2010, S5-RMDR2010

Manufacturer Details

Company: Ecoglo International Ltd
 Address: 77 Kingsley St, Christchurch 8440, New Zealand
 Phone No: +64 3 348 3781

2. Hazard Identification

Not classified as hazardous or dangerous as per GHS.

3. Composition/information on ingredients

Component	CAS No.	Proportion
Aluminium Alloy (5005)	-	70-85%
Strontium Aluminate based photoluminescent pigment	-	5-15%
Cross-linked thermoset polyester based resins	-	10-30%
Other components	-	< 1%

4. First-aid measures No special measures required.

5. Fire-fighting measures No special measures required.

6. Accidental release measures Not applicable.

7. Handling and storage Cut edges may be sharp. No special storage requirements.

8. Exposure controls and personal protection Wear gloves when handling.

9. Physical and chemical properties

Appearance:	Solid sheet material
Odour:	N/A
Melting point:	N/A
Specific gravity:	2.2-2.7 g/cc
Volatile:	N/A
Vapour pressure:	N/A
Vapour density:	N/A
Solubility in water:	Insoluble
Flammability:	Not easily combustible. Passes Bombardier SMP 800-C Toxic gas generation test
Explosivity:	Not explosive

10. Stability and reactivity

Hazardous reactions:	None known
Radioactivity:	Not Radioactive

11. Toxicological information No toxicological properties.

12. Ecological information No ecological hazards.

13. Disposal considerations Offcuts can be sent for aluminium recycling.

14. Transport information Not restricted.

15. Regulatory information None applicable to product.

16. Any other relevant information None.

Appendix 5

Ecoglo International Ltd

Quality Assurance Document

Ecoglo International Ltd QUALITY POLICY

E.I.L is a world leader in the manufacture of photoluminescent signage and path marking. We pride ourselves on our strong focus on compliance and durability. Our policy is to achieve sustainable growth by offering quality products and service. All of our staff are committed to continual quality improvement. The company has earned respect and credibility, at an international level, as a result of our contributions to building code development around photoluminescent system design.

E.I.L maintains an ISO 9001:2015 compliant Business Management System. Management will ensure that all staff are committed to the principles of this system and its continual development.

Our key objectives are:


- To ensure that all products meet contractual and relevant regulatory obligations, both national and international.
- To offer a cost effective and sustainable alternative to traditional electrical lighting that all areas of industry can adopt in a safe and practical manner.
- To offer the most durable photoluminescent products on the market and back them with the best warranty and after-sales support.
- To identify and implement new processes to reduce our product cost without increasing our environmental impact.

Our strategy to achieve these goals is:

- Maintain a high level of staff input on quality control.
- Focus on keeping our staff fully aware of our expected quality output.
- Explore all opportunities to improve our products and processes.
- Effectively recognise the limitations of our product range and work with our clients and competitors to deliver the best result for our clients.
- Be active and engaged in the wider fire safety industry.
- Review any complaints or criticism and use them to construct educational material that assists all levels of industry, both national and international.

Ecoglo International Ltd.

77 Kingsley Street
Christchurch, New Zealand
www.ecoglo.com

Signed: 
 Name: Sam Haughey
 Date: 30/06/2023

Appendix 6

Ecoglo International Ltd

Warranty

Ecoglo International Limited Warranty for Photoluminescent Performance of HTC* Signs and Products

1. We warrant the photoluminescent performance of both Signs and Products, manufactured using our High Temperature Curing (HTC) process, for a period of:

thirty years from the date of installation for standard Signs and Products which are positioned **indoors**; and

fifteen years from the date of installation for **outdoor** Signs (specially coated for **outdoor** conditions) and Products which are positioned **outdoors**.

2. This warranty assumes normal conditions of use and maintenance but does not cover normal wear and tear. This warranty does not cover deterioration due to abuse, mistreatment, natural disasters (e.g. fire, flood), exposure to harmful chemicals or environments or any other use or exposure not recommended in our product literature. In particular, this warranty is void in the following circumstances:

2.1 The Signs and/or Products have been misused, neglected, damaged, abused or involved in an accident.

2.2 The Signs and/or Products have been improperly operated, repaired or maintained.

2.3 The Signs and/or Products have been modified.

2.4 The Signs and/or Products have been used outside their stated specifications, capacity and operating parameters.

3. If you have a claim that, in our reasonable judgement, satisfies the terms of this warranty, we shall replace the defective Sign or Product (material only).

4. This is an express warranty. It is your sole and exclusive remedy. We disclaim any other express or implied warranties, including warranties of merchantability or fitness for purpose, to the maximum extent permitted by law. Under no circumstances shall we accept liability for any injury to persons, damage to property, loss of profits, loss of operations or other direct, indirect, special, incidental, or consequential losses, costs and damages whether incurred by you, your guests, licensees, invitees or other third parties. Our liability under any circumstance, whether in contract, tort or otherwise, shall not, in the aggregate, exceed the price that you paid for the Sign and/or Product.

5. Some countries do not allow certain disclaimers, limitations or exclusions in warranties. Therefore, the above disclaimers, limitations and exclusions may not apply to you. This warranty gives you specific legal rights. You may have other rights or remedies pursuant to the laws of your country. Nothing in this limited warranty should be construed as limiting or restricting any other right or remedy available to you, except as allowed by the law in your country.

Appendix 7

Ecoglo International Ltd

Maintenance and Cleaning Instructions

Instructions For

Maintenance and Cleaning

Exit Signs and Escape Path Markings



Maintenance and Cleaning Instructions For Exit Signs and Escape Path Markings

Overview

- Regular maintenance and cleaning to remove any obstructions or built up dirt and deposits will ensure the Ecoglo products continue performing to expectation.
- The photoluminescence will continue performing even after UV exposure or exposure to moisture.

Floor Mounted Products

- Check nothing is covering up the product.
- Visually inspect for any sign of damage.
- Vacuuming or brushing with a stiff bristle head brush (dry or wet) is often enough to keep the strips clean.
- The glowing strip can also be wiped clean with a (dry or wet) sponge or cloth.
- High-pressure water (but not steam cleaning) can also be used.
- Observation will determine if cleaning is required however a regular clean every 4 to 6 weeks or after particularly heavy use should ensure correct performance.

Wall Mounted Products

- Check nothing is covering up the sign.
- Visually inspect for any sign of damage.
- Dusting with a soft cloth or brush is often enough to keep the signs clean.
- The glowing material can also be wiped clean with a (dry or wet) sponge or cloth.
- Observation will determine if cleaning is required.

Note

- Do not use highly alkaline or acidic cleaning agents. The pH of the cleaning agents should be between pH 5 and pH 12.
- If cleaning agents are applied at more than pH 10, the Ecoglo material should be rinsed with pH neutral (pH 6 to pH 8) solution afterwards.

For more detailed information re inspection and maintenance procedures for signs please see Photoluminescent Lighting Council Standard PLCS 101 2019, Part C - Inspection and Maintenance (available for download from the Homepage at www.plcouncil.com.au)

Ecoglo Fire Protection Product Trading

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Email: InfoPHL@ecoglo.com

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www.EcogloVenues.com

