



Light Emission Distribution Laboratory

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Accredited for compliance with ISO/IEC 17025 for Testing.
Accreditation No. 19541

Test Report: 201145TH

Thermal testing of LED Emergency Handrail to AS/NZS 2293.3 -2018
Appendix D



Prepared for: Offspring Profiles Ltd

The data specified in this report relates to the luminaire/components tested under standard conditions specified in the Test Specification, and may not necessarily relate to other similar luminaires or other operating conditions.

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Product

<i>Type of product:</i>	Sustained Emergency Luminaire
<i>Vendor identification:</i>	Offspring Profiles Ltd
<i>Model numbers:</i>	RICHIE RAIL 20 (sample tested), RICHIE RAIL 26
<i>Description</i>	Sustained wall mounted emergency handrail luminaire. Features extruded aluminium profile, stainless steel cap rail, opal polycarbonate diffuser, a Spec Series Emergency LED strip (model number SPEC-15-40-2.5-40-EME) made of Dongguan Guan mu photoelectric LED chips (model number T2835) powered from a Tridonic LED driver (model number LCU 96W 24V SR TOP), a Streamer DC supplied electronic control gear for emergency LED lighting (model number YH24-1502CV) and a Streamer LiFePO4 12.8V 3Ah battery pack (model number YHBL-4-3.0B/Z).

Test specification

Testing of emergency luminaire in accordance with AS/NZS 2293.3:2018 Appendix D, excluding clause D2 (Light output).

Tests

The luminaire was mounted on a board and tested in a draught-proof room at a nominal 40°C. The high temperature test cycles of AS/NZS 2293.3 appendix D1 applied at supply voltages of 254V, 50Hz and 226V, 50Hz. Then the luminaire was transferred to a cool room at a nominal 10°C. The low temperature test cycles of AS/NZS 2293.3 appendix D2 applied at the supply voltage of 226V, 50Hz. Temperature measurements were made using wire thermocouples attached to the components listed. In addition, use has been made of IES LM-80-2008 test report from the ILAC accredited BACL test laboratory (Report No. R2DG170920050-10-10000-M1) together with the LED data sheet, to determine LED temperature measurement points and thresholds.

Remark

The sample tested (RICHIE RAIL 20) is fitted with a 500mm LED strip. However, the maximum length per feed is 5m. For consistency, we have also tested a sample of the 5m roll to determine battery electrical and thermal parameters and the results herein are representative of a full length of the luminaire. In addition note that this test report also covers the model RICHIE RAIL 26 handrail (a slighter larger version), as the apertures, the inner extruded profile dimensions, diffusers and the electrical gears are identical.


Conclusion

The luminaire **complies** with the requirements of AS/NZS 2293.3:2018 Appendix D.

<i>Minimum duration achieved:</i>	2hrs 28min at the end of hot cycle 1.
<i>Photometric test voltage @ 2hrs:</i>	12.4232VDC @ 1092mA from cold cycle 2.

Client

Offspring Profiles Ltd contact Robin Campbell, 55 Cuba Street, Petone, Lower Hutt 5012, New Zealand

Tested by:	From:	Authorised signatory:	Date: 27/01/2021
David Orwin	17/11/2020 to 07/01/2021		

Alain Yetendje

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Luminaire

Emergency unit

<i>Manufacturer:</i>	Streamer
<i>Model number:</i>	YH24-1502CV
<i>Quantity:</i>	1

Driver

<i>Manufacturer:</i>	Tridonic
<i>Model number:</i>	LCU 96W 24V SR TOP
<i>Quantity:</i>	1

Battery pack / cells as supplied by submitter:

<i>Cell Type:</i>	LiFePO4 Cells
<i>Capacity:</i>	3000mAh
<i>No of cells:</i>	4
<i>Nominal Voltage:</i>	3.2V/cell
<i>Max discharge current:</i>	6000mA
<i>Max charge current:</i>	3000mA
<i>Max battery temperature:</i>	70°C
<i>Max charge voltage:</i>	20V
<i>Min. discharge voltage:</i>	8.0V
<i>Max LED temperature:</i>	105°C
<i>Max LED drive current:</i>	60mA

Uncertainties

<i>AC voltage:</i>	± 0.07%
<i>DC voltage:</i>	± 0.01%
<i>DC current:</i>	± 0.01%
<i>Temperature:</i>	± 3°C
<i>Time:</i>	± 30 seconds

Although uncertainties are given, they have not been applied for the compliance criterion.



Illustration 1: DC supplied electronic control gear

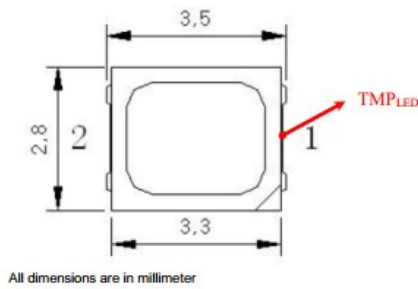


Illustration 3: Thermocouple attached to the LED chip measuring point for this luminaire.

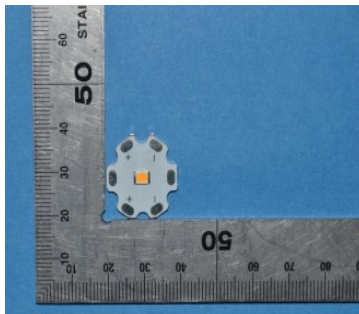


Illustration 2: LED chip as shown in IES LM80 report

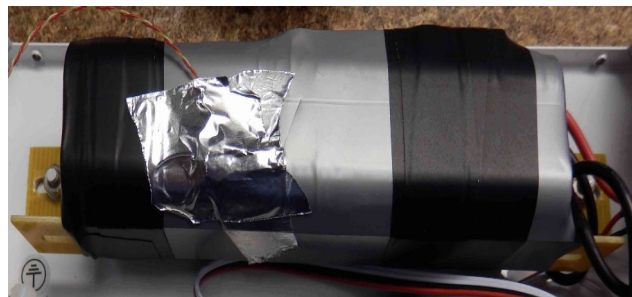


Illustration 4: Battery pack



Illustration 3: LED driver

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Results

The batteries are supplied discharged. They were charged and discharged twice before the test.

High Temperature Test Results (40°C Ambient)

Parameter	Limit	Hot cycle 1 (72hrs)	Hot Cycle 2 (16hrs)	Hot Cycle 3 (16hrs)
Charge Cycle				
Set AC supply voltage (Vac)		254	226	226
Max Battery temperature (°C)	<70	42.5	43.0	42.8
Max Battery charge voltage (V)	<20	14.8969	14.8960	14.8959
Max Battery charge current (mA)	<3000	366.4	351.1	348.3
Max LED temperature (°C)	<105	61.2	60.7	61.0
Max LED drive current (mA)	<60	54.6	54.7	54.6
Charge Amp hours (Ahr)		2.5	2.4	2.5
Emergency lamp status		OFF	OFF	OFF
Normal lamp status		ON	ON	ON
	Limit	Hot cycle 1	Hot cycle 2	Hot cycle 3
Discharge Cycle				
Discharge Duration (Hr.min)	>2	2.28	2.29	2.29
Battery voltage at 2hrs (Vdc)		12.5576	12.5627	12.5638
Battery current at 2hrs (mA)		1170.2	1173.0	1173.4
Max Battery discharge current (mA)	<6000	1371.0	1429.3	1411.1
Amp hour to cut off (Ahr)		2.9	2.9	2.9
Cut off voltage (Vdc)	>8	10.6408	10.2168	10.3560
Battery drain current 15min after cut off (0.0015*°C) (mA)	<4.5	0.20	0.10	0.60
Max Battery temperature (°C)	<70	44.3	44.4	44.5
Max LED temperature (°C)	<105	61.0	61.1	61.2
Max LED drive current (mA)	<60	9.1	9.2	9.1
Emergency lamp status		ON	ON	ON
Normal lamp status		OFF	OFF	OFF
Emergency lamp(s) remained disconnected from battery for 15 min after cut-off		Complied	Complied	Complied

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Low Temperature Test Results (10°C Ambient)

Parameter	Limit	Cold cycle 1 (16hrs)	Cold Cycle 2 (16hrs)	Cold Cycle 3 (16hrs)
Charge Cycle				
<i>Set AC supply voltage (Vac)</i>		226	226	226
<i>Max Battery charge voltage (V)</i>	<20	14.8459	14.8532	14.8556
<i>Max Battery charge current (mA)</i>	<3000	398.5	416.2	416.7
<i>Charge Amp hours (Ahr)</i>		3.2	3.3	3.3
<i>Emergency lamp status</i>		OFF	OFF	OFF
<i>Normal lamp status</i>		OFF	OFF	OFF
	Limit	Cold cycle 1	Cold Cycle 2	Cold Cycle 3
Discharge Cycle				
<i>Discharge Duration (Hr.min)</i>	>2	2.33	2.33	2.33
<i>Battery voltage at 2hrs (Vdc)</i>		12.4235	12.4232	12.4245
<i>Battery current at 2hrs (mA)</i>		1095.2	1091.7	1092.6
<i>Max Battery discharge current (mA)</i>	<6000	1328.3	1326.6	1346.5
<i>Amp hour to cut off (Ahr)</i>		2.8	2.8	2.8
<i>Cut off voltage (Vdc)</i>	>8	10.1995	10.2383	10.0474
<i>Battery drain current 15min after cut off (0.0015°C) (mA)</i>	<4.5	0.0	3.5	0.0
<i>Emergency lamp status</i>		ON	ON	ON
<i>Normal lamp status</i>		NA	NA	NA
<i>Emergency lamp(s) remained disconnected from battery for 15 min after cut-off</i>		Complied	Complied	Complied

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