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Brisbane QLD 4019.



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Accreditation No. 2258.

Test Report No LL1931504T

AS2293.3-2005 Appendix D1 Endurance (Thermal) Test Report



Cat No. :

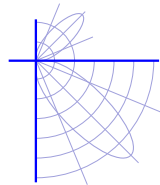
MRS T/1445/SM/WHT/OV FLUSH/HE/450mA/EMERGENCY/STANDALONE MAINTAINED

Emergency LED Profile

Prepared for: Darkon Pty. Ltd.



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Client	Jeffrey Lawson Darkon Pty. Ltd. 110 Cromwell Street, Collingwood, VIC 3066.
Luminaire Tested	MRS T/1445/SM/WHT/OV FLUSH/HE/450mA/EMERGENCY/STANDALONE MAINTAINED 1445 mm emergency LED profile. Maintained
Represented Luminaires	-
Notes	Lamps used for test were as supplied.
Nature of tests	To measure the minimum discharge duration, and other quantities (refer Tables 1 & 2), when operated in accordance with the conditions specified in appendix D1 of the reference standard, comprising AS2293.3-2005 and AS2293.3-2005/Amdt 1-2010.
Procedure	TP-AS2293AppD(2005)-A0. Briefly, the luminaire was mounted onto a simulated ceiling/wall in a thermal test chamber. Fine wire thermocouples were attached to the batteries. Battery temperature, voltage, current and lamp state sensing were logged using a 6½ digit data acquisition unit connected to a PC. Luminaire power was supplied by a stabilised ac source.
Sampling	The laboratory has not participated in the selection of samples to be tested. All testing is performed on the understanding that the significance of the report is limited to the extent that the test sample is representative of production units.
Applicability	The data presented in this report is applicable only to the sample tested.
Uncertainties	Uncertainties available on request
Min. duration achieved	03:21:38 (hot cycle No. 3)
Min. voltage at initial duration	3.640 Vdc @ 905 mA (hot cycle No. 2)
Max. battery temperature	50.5 °C
Compliance Summary	Results for all test cycles, when tested to the following requirements of appendix D1 of the reference standard: <ul style="list-style-type: none"> * Minimum discharge duration - complies * Minimum voltage at initial duration - complies * Minimum voltage at cutoff - complies * Maximum battery temperature - complies * Maximum charge current - complies * Maximum discharge current - complies * Maximum charge voltage - complies * Maximum drain current - complies

Authorised Signatory

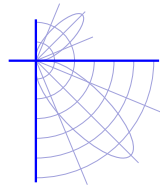
Toby Southgate

Date of test commencement 11th November, 2019

Date of report 12th December, 2019

B3002 - Report version 2.5, 20 Apr 2017





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Luminaire details

Hot Cycle

Mains lamp operation.	On
Mounting	Ceiling / Surface
Diffuser	Opal

Cold Cycle

Mains lamp operation.	Off
Mounting	Wall / Surface
Diffuser	Opal

Luminaire rated Voltage 240V 50Hz

Inverter/control pack

Manufacturer	Tridonic
Catalogue No.	EMconverterLED BASIC 203 NiCd/NiMH 90V

Lamp(s)

Manufacturer	Tridonic
Catalogue No.	LLE 24x560mm 1300lm 840 HV ADV5 (PCBs x2) LLE 24x140mm 325lm 840 HV ADV5 (PCBs x 2)
Quantity	60
Description	LED

Battery pack / cells (Information supplied by the client, document ID: DARK002)

Cell type	NiMH				
IEC Compliance	Evidence cited: Document no. GNRL103				
Cell manufacturer	GP Battery				
Cell cat. no.	GP400LALHT				
Battery pack manufacturer	Tridonic				
Battery pack cat. no.	89800441				
Number of cells	3	per string			
Number of strings	1		String max. charge current	400	mA
Cell capacity	4000	mAh	String Max. discharge current	1800	mA
Cell nominal voltage	1.2	V	Cell max. charge voltage	1.8	V
Cell max. surface temperature	70	°C	Cell min. discharge voltage	0.8	V

Ballast(s)

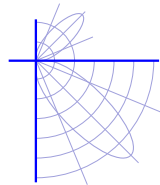
Manufacturer	Tridonic
Catalogue No.	LCA 75W 350-1050mA one4all Ip PRE
Quantity	One
Description	Electronic

P.F Capacitor

Not present

Manufacturer	-
Catalogue No.	-
Quantity	-
Description	-





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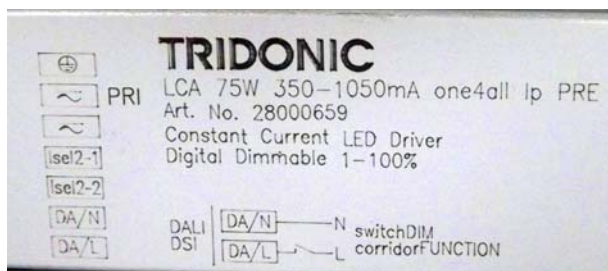
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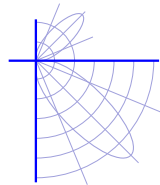
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Photographs showing components



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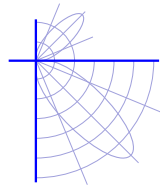
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Photographs showing component layout



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Table 1 - High Temperature Test Results

Test Conditions ⁽¹⁾	Unit	Requirement	Hot cycle 1 (72 h charge)	Hot Cycle 2 (16 h charge)	Hot cycle 3 (16 h charge)	Compliance
Ambient temperature	°C					
- average measured			40.0	40.0	40.0	
- instantaneous		40 ± 2	C	C	C	
Supply voltage	Vac					
- average measured			254.5	226.3	226.3	
- instantaneous		(106 ± 1)% of value ^(2a) (94 ± 1)% of value ^(2b)	C n/a	n/a C	n/a C	
Supply frequency	Hz					
- average measured			50.0	50.0	50.0	
- instantaneous		(100 ± 1)% of value ⁽³⁾	C	C	C	
Charge Cycle ⁽¹⁾						
Max. charge voltage	Vdc	< 5.400	4.205	4.105	4.116	C
Max. charge current	mA	< 400	195	195	195	C
Max. battery temperature	°C	< 70.0	50.5	49.0	49.0	C
Charge amp hours	Ah	n/a	9.4	3.1	3.1	n/a
Emergency lamp status		On	On	On	On	n/a
Discharge Cycle ⁽¹⁾						
Discharge duration	hh:mm:ss	≥ 01:59:42	04:48:53	03:23:24	03:21:38	C
Voltage at initial duration ⁽⁴⁾	Vdc	> 2.400	3.652	3.640	3.653	C
Current at initial duration ⁽⁴⁾	mA	< 1800	904	905	904	C
Amp hours to cut-off	Ah	n/a	4.4	3.1	3.0	n/a
Voltage at cutoff	Vdc	> 2.400	3.105	3.102	3.103	C
Max. discharge current	mA	< 1800	907	906	906	C
Emergency lamp status ⁽⁵⁾		On	On	On	On	C
Battery drain current after cutoff ⁽⁶⁾	mA	< 6.0	0.1	0.2	0.1	C

Notes for Table 1

* In the case where the sample tested was a maintained emergency escape luminaires or a combined emergency escape luminaire, all lamps that provide normal lighting: were illuminated during each charge cycle and were switched off during each discharge cycle.

⁽¹⁾ Compliance tested to specifications in Table D1 of the reference standard.

Notes common to Tables 1 and 2

* Uncertainties of measurement are taken into account when comparing measured values against limits in accordance with NATA guidelines. Namely, when comparing against a limit, a value in the passing region, or lying on the limit is deemed to comply.

* "n/a" means not applicable, "C" means complies with requirement, "DNC" means does not comply with requirement

^(2a) "Value" is the rated voltage or the highest marked voltage where a voltage range is given.

^(2b) "Value" is the rated voltage or the lowest marked voltage where a voltage range is given.

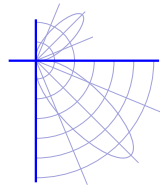
⁽³⁾ "Value" is the rated frequency or the frequency that results in the most onerous condition where: a frequency range is stated and if the frequency can have an effect on battery performance.

⁽⁴⁾ Initial duration is specified in AS2293.1-2005 Clause 2.2, being 1.33 * 90 minutes

⁽⁵⁾ "On" represents all emergency lighting lamps were illuminated throughout the discharge until cutoff

⁽⁶⁾ Value of limit is calculated from either: C * 0.0015 (where C is the charge capacity of a cell in mAh), or the value submitted by the client. The battery drain current is measured 15 minutes after cutoff.





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Table 2 - Low Temperature Test Results

Test Conditions ⁽¹⁾	Unit	Requirement	Cold cycle 1 (16 h charge)	Cold Cycle 2 (16 h charge)	Cold cycle 3 (16 h charge)	Compliance
Ambient temperature - average measured - instantaneous	°C	10 ± 2	9.3 C	9.3 C	9.7 C	
Supply voltage - average measured - instantaneous	Vac	(94 ± 1)% of value ^(2b)	226.0 C	226.0 C	226.0 C	
Supply frequency - average measured - instantaneous	Hz	(100 ± 1)% of value ⁽³⁾	50.0 C	50.0 C	50.0 C	
Charge Cycle ⁽¹⁾						
Max. charge voltage	Vdc	< 5.400	4.188	4.189	4.189	C
Max. charge current	mA	< 400	195	195	195	C
Max. battery temperature	°C	< 70.0	12.4	12.3	13.1	C
Charge amp hours	Ah	n/a	3.1	3.1	3.1	n/a
Emergency lamp status		Off	Off	Off	Off	n/a
Discharge Cycle ⁽¹⁾						
Discharge duration	hh:mm:ss	≥ 01:59:42	03:26:53	03:26:53	03:27:23	C
Voltage at initial duration ⁽⁴⁾	Vdc	> 2.400	3.677	3.678	3.682	C
Current at initial duration ⁽⁴⁾	mA	< 1800	901	902	902	C
Amp hours to cut-off	Ah	n/a	3.1	3.1	3.1	n/a
Voltage at cutoff	Vdc	> 2.400	3.082	3.083	3.081	C
Max. discharge current	mA	< 1800	905	904	904	C
Emergency lamp status ⁽⁵⁾		On	On	On	On	C
Battery drain current after cutoff ⁽⁶⁾	mA	< 6.0	0.1	0.1	0.1	C

Notes for Table 2

* In the case where the sample tested was a maintained emergency escape luminaires or a combined emergency escape luminaire, all lamps that provide normal lighting: were switched off during each charge cycle and were switched off during each discharge cycle.

⁽¹⁾ Compliance tested to specifications in Table D2 of the reference standard.

