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Hong Kong

Our reference: CM-22-R024

Issue date: 3 August 2022

The self-contained emergency exit sign / directional sign supplied by you was tested in our laboratory on 9 July 2019 and the results were presented as follows;

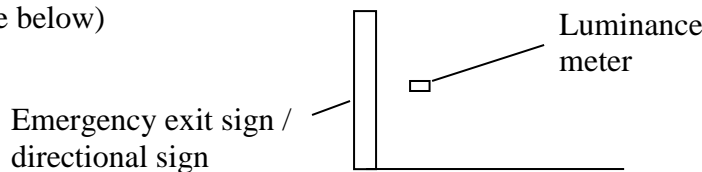
Description of luminaire:	"Golden Star" self-contained emergency exit sign plate / directional sign plate, using LED lamp (single / double side)
Complete set model:	ES-2C-630, ES-2C-630R
Input:	AC 220-240V +/-10% 50Hz
Battery:	Sealed Ni-Cd / Ni-MH rechargeable battery pack (3.6V 1.0Ah)
Full charge period / Duration:	12 hours / 3 hours
Lamp type:	3W LED lamp
Test button and charging LED:	Incorporated
Low voltage cut off:	Incorporated
Power cables:	No power cables extended outside the enclosure of the self-contained emergency luminaire

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Test procedures;

1. After 12 hours of charging at 220V 50 Hz AC supply, the emergency exit sign / directional sign has attained 100% of its rated battery capacity.
2. The emergency exit sign / directional sign was placed vertically on a desk and a luminance meter was placed at a distance of about 5 cm away pointing to the exit sign / directional sign. Luminance measurement was carried out in a dark room so that light emitted by the emergency exit sign / directional sign will not affect the measurement. (see figure below)



3. The test button on the exit sign / directional sign was pressed so that the emergency exit sign / directional sign was now powered by its own battery and the battery voltage and luminance was measured at 5 s, 1 min, 30 min and then at 30 min intervals until the rated duration. The total duration of emergency exit sign / directional sign was recorded.

The results are as follows;

1. Luminance of emergency exit sign / directional sign (operated on battery supply)

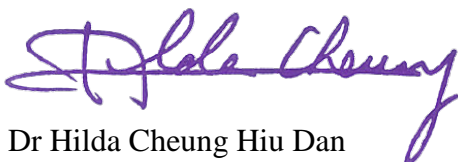
Time (min)	Battery Volt (V)	Luminance (cd/m ²)
Normal		31
5 s	4.1	33
1	4.1	36
30	3.9	30
60	3.8	27
90	3.7	25
120	3.6	22
150	3.4	20
180	3.1	18

2. The total discharge time is 183 minutes at which the batteries were disconnected by the incorporated low voltage cut out device.
3. The exit sign / directional sign passed the resistance to flame and ignition at a temperature of 850°C as stipulated in clause 13.3.2 of IEC 60598-1:2020, clause 22.16 of BS EN 60598-2-22:2014+A1:2020 and IEC 60695-2-10:2013.

Summary of compliance with PPA/104(A)(5th Revision)

Item	Test Requirement of PPA/104(A) (5 th Revision)	Verdict
B.3	Emergency lighting luminaires shall be compliant with the glow wire test as stated in sub-clause 13.3.2 of IEC 60598-1:2020 but at temperature of 850°C.	pass
B.4	All power cables extended outside the enclosure of a self-contained emergency lighting luminaire, other than the wiring connecting the luminaire to normal supply shall conform to: (a) BS EN 50200: 2015 (PH60) and Annex E of BS EN 50200: 2015 (a duration of survival time of 30 minutes) and one of the following standards: (i) BS EN 60702-1: 2002 +A1: 2015 & BS EN 60702-2: 2002 +A1: 2015 (ii) BS 7629-1: 2015 (Cat. Standard 60) (iii) BS 7846: 2015 (Cat. F2 for cables of overall diameter not exceeding 20mm); or (b) BS 6387: 2013 Cat. CWZ.	Must be complied with
B.5	An automatic trickle charger with a 220-volt input and suitable output and fitted with pilot lights or other indicating device shall be provided for the batteries. The charger shall be capable of re-charging the battery to 100% of the rated capacity in not more than 12 hours.	pass
B.6	The self-contained luminaires emergency lighting systems shall be capable of maintaining the stipulated lighting levels for a minimum period of 2 hours (rated duration).	pass
B.7	Upon failure of the normal lighting system or in the event of power failure, the emergency lighting shall automatically light up to at least 90% of the stipulated illumination level within 5 seconds.	pass
B.8	Each unit shall be provided with a properly labeled 'TEST' switch and charge monitor light. A low voltage cut out shall also be provided to disconnect the batteries when fully discharged.	pass

Our measurement complied with relevant sections of BS 5266-1:2016, BS EN 1838:2013, BS 5499-4:2013, clause 13.3.2 of IEC 60598-1:2020, clause 22.16 of BS EN 60598-2-22:2014+A1:2020, FSD COP for Minimum Fire Service Installations (2012) Clause 5.10 on Exit and Directional Signs and Regulation PPA104(A) (5th Revision) of Fire Services Department specifications.



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This certificate is issued by PolyU Technology and Consultancy Co. Ltd. (PTeC) to C.M. Fire Equipment Limited for the Consultancy Service Agreement signed by both parties. PTeC is the wholly-owned subsidiary of The Hong Kong Polytechnic University (PolyU) and is assigned by the PolyU to deal with all commercial matters on its behalf for the undertaking of external consultancy projects.

This is to certify that the above test was conducted at the laboratory of Department of Building Environment and Energy Engineering of The Hong Kong Polytechnic University with reference to the Agreement signed by both parties.