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TEST REPORT

REPORT NO : 2018MA0472

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THIS TEST REPORT IS ISSUED IN SECURED PDF SOFTCOPY

Applicant : AVIATRADE SDN BHD (ROC : 260500-H)
22A, Jalan Kristal K7/K,
Seksyen 7, Shah Alam
40000 Selangor Darul Ehsan
(Attn. : En Suhaili Kamal)

Manufacturer : Solution4GA SP.Z.O.O
Sylwestra Kaliskiego 57,
01-476 Warsaw,
Poland

Product : SOLAR OBSTACLE LIGHT LOW INTENSITY TYPE A

Reference Standard / Method of test : ASD 404: Airport Standards Directive 404
Clause 4 : Performance Requirements
Clause 5 : Equipment Qualification Requirements

Description of sample / Description of Test Specimen : Obstacle Light (Powered by SOLAR) – Low Intensity Type A
Light Type Code : DCA/L/A [fixed obstacle]
Brand : S4GA Portable LED Lighting
Model : SP-102-OBS

Date Received of Complete Application : 04 April 2018

Job No. : J20181390216

Description of Test Results / Overall Test Result : The submitted test samples as describe in the test report complied with the requirements of the above standard

Issued date : 29 June 2018

Approved Signatories;


.....
(NOOR AZLIE BIN AHMAD)
Testing Executive




.....
MOHD FAIZAR BIN MUSTAFA)
Head
Mechanical & Automotive Section
Testing Services Department

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Summary of Results for Qualification Tests

DCA/L/A* – Model: SP-102 OBS

The following is a summary of the results of tests of the Device Under Test (DUT) performed in accordance with the following ASD 404: Airport Standards Directive 404, First published July 2007 specifications issued by Department of Civil Aviation Malaysia

Test Item	Requirements Clause (ASD 404 directive)	Remarks
Photometric	4.1.1	
- Luminous Intensity		Pass
- Colour Measurement		Pass
High temperature	5.1.7	Pass
Low temperature	5.1.8	Pass
Rain test – IPX5	5.1.9	Pass
- IP6X – dust ingress protection		Pass
Wind test	5.1.10	Pass
Humidity test	5.1.11	Pass
System Operational Test	5.1.12	Pass
Leakage Current test	5.1.13	Pass
Lightning Surge Test	5.1.14	Not Applicable
Visual Examination	5.1.15	Pass

*Remark

DCA/L/A is only applicable for the lighting of obstacles at air terminals



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Introduction : A request was received by AVIATRADE SDN BHD for performing Obstacle Light Qualification Tests, Low Intensity, Type Code: DCA/L/A for Department of Civil Aviation Malaysia (DCA) accordance to ASD 404: 2007- Airport Standards Directive 404 for Lighting of Obstacles.

Objective : This test report contains the results of examination and tests of the Device under test (DUT) to demonstrate compliance with the applicable requirements of ASD 404: 2007 of Department of Civil Aviation (DCA).

Test Result : Detail of test results are shown from Page 4 to 9 in this test report. .



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Clause	Test item	Judgement
4.1	Photometric	
4.1.1	Low Intensity Type DCA/L/A light unit	
	The centre of vertical beam spread shall lie between +4° and +20°	Pass
		Maximum intensity between V: +9° to +18°
	With a minimum vertical beam spread of 10° and at all radials throughout the omni-directional 360° there shall be a minimum intensity of 10 candelas	Pass Test data in Page 5
	Colour measurement	Result: Red Pass Refer to page 6



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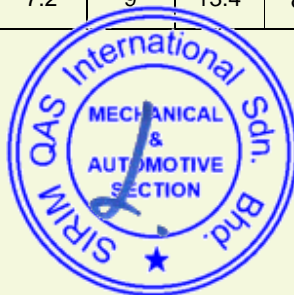
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Photometric test data:

Burn in (sec) 60
 Measurement distance (m) 10

Axis	Luminous Intensity (cd)											
	0	30	60	90	120	150	180	210	240	270	300	330
20U	14.9	13.8	13.3	13.5	14.4	9.8	15.1	15.6	16	15.9	13.6	12.9
19U	16.4	17.3	16.5	14.9	12.7	8.4	13.3	13.2	16.1	16.6	13.9	12
18U	16.2	17.6	18.5	17.9	15.4	11.1	13.4	12.6	13.5	15	14.8	16.7
17U	14.8	13.2	14.2	14.4	14.3	12.3	16.1	15.9	17.4	16.5	13.9	12.5
16U	15.2	13.9	13.6	14	14.1	13.4	17.2	12.9	13.8	15.2	16.3	16.4
15U	16	13.1	13.6	16.3	16.5	11.7	13.5	13.7	17.8	17.1	12.7	12.7
14U	15.7	14.6	12.8	15	15.8	12.3	13.2	15.4	17.6	16.9	13.3	12.6
13U	16.8	13.1	16.4	16.1	13.5	10.7	12.8	14.1	13.8	15.1	15.4	13.1
12U	13.6	16.1	15.7	13.6	11.6	12.8	17.1	13.6	17.9	13	12.1	15.4
11U	17.9	14.9	13.9	15.5	14.5	12.1	12.3	17.4	16.2	15.8	15.9	12.5
10U	14.5	12.5	14.6	12	12	14.6	12	13.6	13.8	14.9	13.5	10.4
9U	17	12.2	11.7	13.6	10.3	13.5	13.3	17.4	13.4	13.8	10.2	8.8
8U	13.4	11.5	13.2	9.2	12	10.8	12.9	15.7	16.9	11.6	11.8	8.4
7U	14.4	10.3	11.8	10.2	8.7	14.2	11	13.4	12.2	11.2	8.1	10.7
6U	13.7	9.7	11.3	7.2	9	13.4	8.5	11.1	13.7	8.3	9.6	7.3
5U	12.7	8.7	9.2	8.8	8	13.2	7.5	12.7	9.2	9.7	8.8	7.4
4U	11.3	7.8	9.1	8.2	7.2	9.2	9.8	8.4	10.5	8.4	6.2	8.2

Peak (cd)	17.9	17.6	18.5	17.9	16.5	14.6	17.2	17.4	17.9	17.1	16.3	16.7
10°	14.5	12.5	14.6	12	12	14.6	12	13.6	13.8	14.9	13.5	10.4
6°	13.7	9.7	11.3	7.2	9	13.4	8.5	11.1	13.7	8.3	9.6	7.3



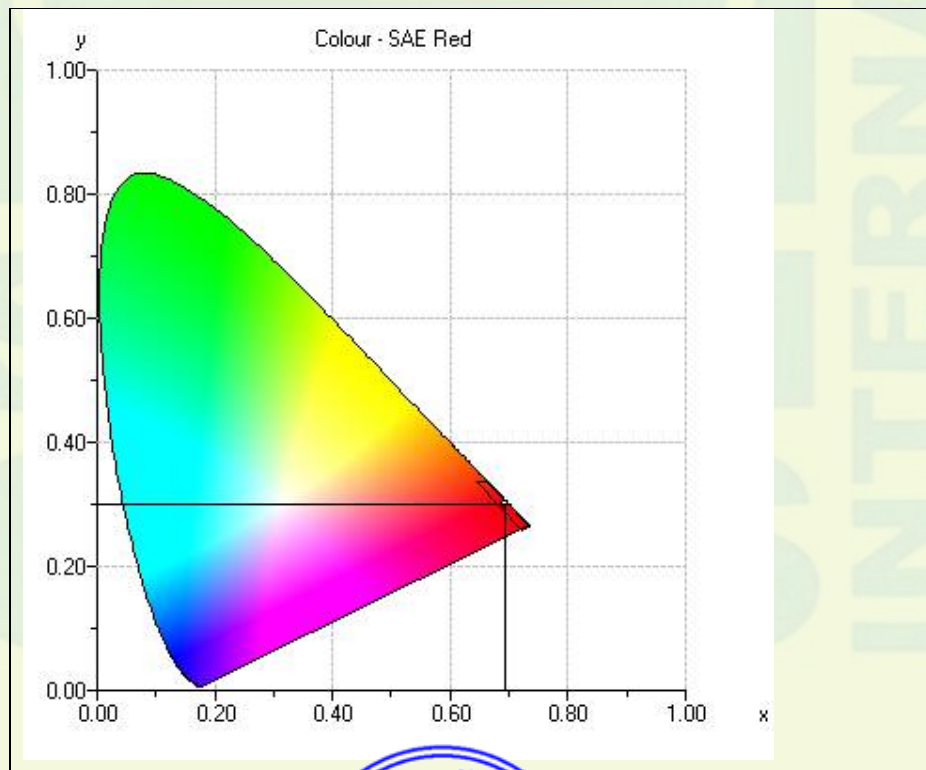
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Colour Measurement:

Burn in (sec) 60
 Measurement distance (m) 3.16

Test Result:

Direction		Coordinate	
H	V	x	y
0	0	0.6928	0.2998



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Clause	Test item	Judgement
5.0	Equipment Qualification Requirements	
5.1	Qualification tests	
5.1.7	High temperature test	
	The DUT of type code DCA/L/A was placed in preheated chamber at 50°C ± 2°C and allowed to temperature stabilized. The DUT was operated at rated input condition for 4 hours.	There was no deterioration in material and the DUT operated properly.
	The DUT was examined visually for any deterioration in materials and proper condition.	Pass
5.1.8	Low Temperature Test	
	The DUT was placed in cold chamber at 0°C for 24 hours. The DUT was turned on for a one hour time period.	There was no deterioration in material and the DUT operated properly.
	The DUT was examined visually for any deterioration in materials and proper condition.	Pass
5.1.9	Rain test	
	The DUT was placed at a rate 5.2 inches per hour (130 mm/hour). The DUT was operated throughout an exposure of 30 minutes cycle for each side.	During exposure to the rain test, the DUT operated properly. There was no excessive accumulation of
	Failure of the equipment to operate as specified or any deterioration in material shall constitute failure of test.	water in DUT Pass



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Clause	Test item	Judgement
	<p>IP 6X – Dust test</p> <p>The DUT was placed in Dust chamber and been tested in accordance to IEC 60529.</p> <p>The DUT was examined visually for any deposit of dust penetrate into enclosure at the end of the test.</p>	<p>Upon completion the test, no ingress of dust penetrated into the enclosure. The DUT operated properly.</p> <p>Pass</p>
5.1.10	<p>Wind test</p> <p>An equivalent mechanical force was calculated and to demonstrate the DUT meet wind speeds up to 150 km/h wind. The mechanical force was applied to the DUT perpendicular to its axis. The force was calculated with the following formula: $F_d = \frac{1}{2} \cdot C_d \cdot \rho \cdot A \cdot V^2$</p> <p>The DUT was examined visually for any damage or permanent deformation.</p>	<p>The DUT withstood the applied mechanical force of 9 kgf without any damage or permanent deformation.</p> <p>Pass</p>
5.1.11	<p>Humidity test</p> <p>The DUT was subjected to three complete daily cycles with a maximum of 72 hours at temperature 55°C and 95 % RH.</p> <p>Failure of the equipment to operate as specified or any deterioration in material shall constitute failure of test.</p>	<p>There was no deterioration in material and the DUT operated properly.</p> <p>Pass</p>



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Clause	Test item	Judgement
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5.1.12 **System Operational Test**

The DUT system was energized and operated for 1000 continuous hours with normal 12 hours day/night cycling.	The DUT operated normally during and after test without any malfunction or any abnormalities.	
Failure of the equipment to operate as specified or any deterioration in material shall constitute failure of test.		Pass

5.1.13 **Leakage Current test**

Leakage current shall be measured between primary power connection points to the DUT chassis. The primary power connection points may be connected together during the test, but all other internal wiring must be connected as in normal operation. Devices for surge and lighting protection connected directly to input power wiring may be disconnected during the test.	.	Pass
The leakage current of DUT did not exceed 10 microamperes when the voltage applied.		

5.1.14 **Lightning Surge Test**

Subject to 2 pulse at 15 sec intervals to a combination wave 1.2msec/50msec and 8msec/20msec (6kV, 3kAmp) test pulse, under Category C1 of IEEEC62.41	Not applicable Powered by SOLAR	
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5.1.15 **Visual Examination**

The DUT was examined for compliance with the requirements on material, finish and quality of workmanship.	Pass. The DUT met the requirement on materials, finishing and quality of workmanship.	
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**PHOTOGRAPH OF DEVICE UNDER TEST (DUT) OF LOW INTENSITY-TYPE A
MODEL: SP-102 OBS**



Photo 1: View of Device under Test



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Appendix 1

GENERAL PRODUCT INFORMATION (as Declared by the Applicant)

Product description	: Low Intensity LED type Obstruction Light –Type A
Brand	: S4GA Portable LED Lighting
Model	: SP-102-OBS
Manufacturer	: Solution4GA SP.Z.O.O, Poland
DCA Type Code	: Low Intensity – DCA/L/A
Control Gear/Driver	: Deep-cycle VRLA/SOLAR Panel/storage battery: 6V/4.5 Ah
Lamp used	: LED
Power Requirements	: 5W (Solar Panel)
Lamp current	: 4.5 Amp (dc)
Luminous Flux (lm)	: 3.0
Flash rate (fpm)	: Steady burning
Flash duration (ms)	: Not applicable
Overall Dimension	: 210 mm x 125 mm
Weight	: 2.0 kg
Material of body	: Aluminum Alloy
Material of Diffuser/Cover	: Glass



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1. A Test Report will be issued in respect of Testing Services conducted and shall relate only to the Sample actually tested. SIRIM QAS International makes no warranty whatsoever and the Applicant shall not represent in any manner that any duplication or mass production of the Product is same as the Sample actually tested or that SIRIM QAS International has tested any of the duplicated or mass produced Product.
2. The Test Report shall not be amended, changed, varied or modified in any manner whatsoever by the Applicant or otherwise.
3. If the Test Report is to be furnished to any third party or to the public, each such Test Report shall be furnished in full, legible and in its entirety.
4. The Test Report shall not be reproduced and shall not in any event be used for any advertising purposes or whatsoever without written approval from the Managing Director of SIRIM QAS International of No 1, Persiaran Dato' Menteri, Building 8, Section 2, P.O. Box 7035, 40700 Shah Alam, Selangor Darul Ehsan.
5. Customer (Applicant/Manufacture/Factory, etc.) is not permitted to use any SIRIM QAS International, SIRIM or other SIRIM's subsidiaries logo or words on packaging, sample's manual, technical specification, brochures/flyers or any other means without the prior written approval from the Managing Director of SIRIM QAS International.
6. If such approval is obtained from the Managing Director of SIRIM QAS International, the Applicant may only include the phrase, "A sample of this product has been tested by SIRIM QAS International ... (Test Report No) ... (dated) (for what test) ... (to which standard)" or such similar words which stress that only the Sample was actually tested. This phrase shall only be used for the purpose of product advertisement or product promotion (eg; brochures). For avoidance of doubt, the statement shall not be used on the sample and packaging of the sample.
7. In the event there is an investigation from a Government Regulatory Agency concerning the Applicant's Test Report, SIRIM QAS International may disclose the information pertaining to the Test Report for purposes of such investigation.
8. Further or in the alternative, it is strictly forbidden unless with prior written approval from the Managing Director of SIRIM QAS International, to represent in any manner whatsoever that SIRIM QAS International, SIRIM and/or other SIRIM's subsidiaries has endorsed, approved or validated the Product of the Applicant in any manner whatsoever.
9. In the event the Applicant is found in breach of this provision, SIRIM QAS International, SIRIM and/or other SIRIM's subsidiaries without prejudice to any other rights and remedies may take whatever action necessary including but not limited to:
 - a) Informing and placing a notice in the media;
 - b) Obtaining an injunction from Court (cost on a solicitor-client basis to be borne by the Applicant);
 - c) Refusing to accept any further Product for Testing Services from the Applicant or whosoever related to the Applicant, whether subsidiary or otherwise;
 - d) Instructing the Applicant to withdraw and recall the advertisement, statement or document in question and advertise a clarification and apology to SIRIM QAS International, SIRIM and/or other SIRIM's subsidiaries twice in a national publication of SIRIM QAS International's choice at the Applicant's sole cost; and
 - e) Informing or lodging a report pertaining the Applicant's Test Report with the relevant authorities.
10. Certified true copies of the Test Report may be issued upon request by the Applicant upon payment of the relevant fee.
11. Corrections to test report shall only be allowed within 6 months from issuance date of the test report and shall be limited to maximum 3 times, after either case whichever occurs earlier, a new test report shall be issued and replace the previous one (having error(s) or lack of information). Issuance of Supplementary Report to the original Test Report shall be for the followings;
 - a) Misprints and typo errors
 - b) Missing technical information
 - c) Test data not reported
 - d) Mistake in reporting of test data