Hunan Lingte Technology Co., Ltd

TEST REPORT

SCOPE OF WORK
ICAO Performance Testing - Medium Intensity Type B Obstacle Light

REPORT NUMBER
104223291CRT-001

ISSUE DATE
18-Mar-2020

PAGES
7

DOCUMENT CONTROL NUMBER
NA
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Test Report			
Company Name	Hunan Lingte Technology Co., Ltd	**Test Location**	Intertek Testing Services NA
Address	Building A4	**Address**	3933 US Rt 11
	Tongxin International Industrial Park		Cortland, NY 13045
	No. 169, Huizhi Middle Road		USA
	High-tech Zone		
	Changsha, China		
Client Contact	Tiffany Zhang	**Quote Number**	Qu-01031342-0
Phone	+0-731-8592-5707	**Test Start Date**	February 11th, 2020
Email	zds@linterk.com	**Completion Date**	March 5th, 2020

Standard(s)
International Civil Aviation Organization (ICAO), Aerodromes, Annex 14, Volume 1, Eighth Edition, dated July 2018

Spec.	Test name	Clause	Result
ICAO	Photometry Med Intensity Type B (Red Night)	Table 6-1 & Table 6-3	Pass
ICAO	Chromaticity ICAO App. 1 (Red)	2.3.1	Pass

Results Key	
Pass	Compliant
Fail	Non-compliant
TBD	Compliance not determined
NT	Not tested in this project
NA	Test not applicable

Lynette Smith
Engineer
Lighting

Christopher W. Metcalf
Engineering Supervisor
Lighting

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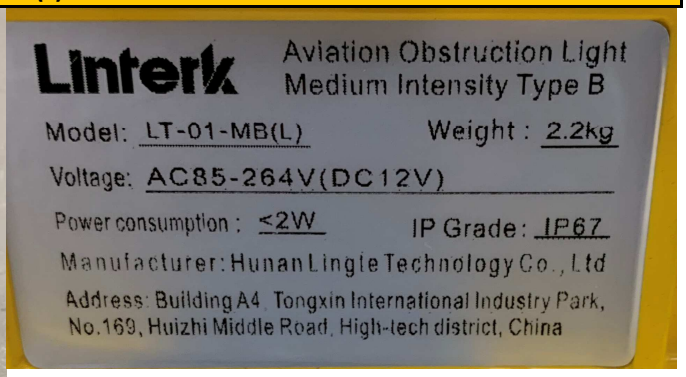
Sample Information				
Date Rec.	Intertek ID	Description	Condition	Model No.
2/3/20	CRT200203307-008	Medium Intensity Type B	Production	LT-01-MB(L)
2/3/20	CRT200203307-007b	Controller Operating Instruction	Production	NA

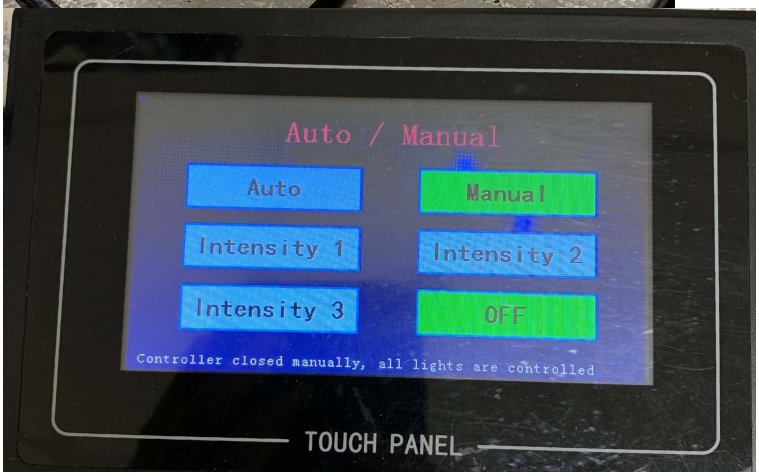
Further Sample Description	
Type:	Medium Intensity Type B Obstruction Light
Options:	GPS
Light Source:	[40] Red Cree USA LEDs, XPE2
Lens:	PC, BAYER Germany (Model: 2807)
Approx Size:	Height: 5.5" Width/Length: 6.5"
Electrical Input:	85-264 VAC, <2W
Casting Material:	Aluminum Alloy
Mounting:	[4] Thru-holes for tower mounting

Sample Modification Log	
Date	Modification description

Picture(s)


有电危险
请勿开盖


Linterk
Aviation Obstruction Light
Medium Intensity Type B
Model: LT-01-MB(L)
Weight : 2.2kg
Voltage: AC85-264V(DC12V)
Power consumption : ≤2W
IP Grade: IP67
Manufacturer: Hunan Lingte Technology Co., Ltd
Address: Building A4, Tongxin International Industry Park,
No.169, Huizhi Middle Road, High-tech district, China


Auto / Manual
Auto
Manual
Intensity 1
Intensity 2
Intensity 3
OFF
Controller closed manually, all lights are controlled
TOUCH PANEL

Photometry - Medium Intensity Obstacle Light (Flashing)

Energize the light by the system power supply and control unit and test for compliance with the photometric requirements in Table 6-2. Vary the input voltage to the light ± 10% from nominal voltage and measure the effective intensity at the input extremes. Make the effective intensity measurements using an integrating photometer whose calibration is traceable to an NIST steady state source. The test distance is 100ft. The horizontal beam spread is 360 degrees.

Results

ICAO Medium-Intensity, Type B (Red Night)

Table 6-3 Requirements

Parameter	Requirement	Measured		Result
Flash Rate (FPM)	20-60 FPM	40	FPM	Pass
Minimum Ave Intensity (cd)	2,000 cd at 0°	2345	cd	Pass
Minimum Intensity (cd)	1,500 cd at 0°	2080	cd	Pass
Minimum Intensity (cd)	750 cd at -1°	938	cd	Pass
Beam Spread	≥3° at each vertical slice (min 750cd)	3	cd	Pass

Table 6-3 Recommendations

Parameter	Requirement	Measured		Result
Maximum Intensity (cd)	2500cd at 0 degrees	2530	cd	NA
Maximum Intensity (cd)	1125cd at -1 degrees	1840	cd	NA
Maximum Intensity (cd)	75cd at -10 degrees	8	cd	NA

Sample	Voltage Variation	Voltage	Position	Measured	Factor	Result
CRT200203307-008	Input Voltage	85.1	(0,0)	3980	NA	NA
	Input Voltage -10%	76.5	(0,0)	4000	100%	Pass
	Input Voltage +10%	290.6	(0,0)	3970	100%	Pass

Cable Length (ft.):	5'	Calibration Factor:	2.45E-12	Input:	85.1 Vac
Flash Duration (sec):	0.160	Neutral Density Filter:	N/A		
Flash Period (sec.):	1.50				

Effective Intensity (cd)

Vertical Position (deg)	Horizontal Position (deg.)											
	0	30	60	90	120	150	180	210	240	270	300	330
3U	1195	920	757	977	765	723	1044	801	826	1063	855	862
2U	1535	1496	1290	1329	1312	1301	1373	1412	1362	1440	1435	1357
1U	1857	1991	1790	1607	1796	1846	1763	1913	1935	1785	1968	1918
0	2246	2513	2346	2080	2302	2424	2352	2446	2530	2335	2335	2230
1D	1068	938	1423	1840	1668	1457	1624	1401	1112	1529	1435	1162
2D	47	47	134	245	175	111	94	71	71	63	70	63
3D	24	35	52	74	56	57	56	51	38	37	42	24
10D	6	6	6	8	7	6	8	6	6	8	6	6

Complies: ☑ YES ☐ NO

Tested By:	Brittany James	Signature or initials:	
Engineer:	Lynette Smith	Signature or initials:	Lynette Smith
Reviewed By:	cwm	Signature or initials:	cwm
Test Equipment Used:	1, 2, 3, 4, 5, 6	Sample No:	CRT200203307-008
Amb (ºC):	25 RH% 18	Completion Date:	3/5/2020

Chromaticity ICAO

Test the fixture with the lamp, filter and optical system for color of light emitted. Chromaticity Coordinates are to be calculated from a spectral distribution measured in 2nm increments for LEDs, and 5nm increments for incandescent. Measure the color after stabilization at rated input at the main beam center and beam extremes.

Results - ICAO LED Red

Sample	Color	Input	Location	x	y	z	(P/F)
CRT200203307-008	Red	85.0	(0,0)	0.694	0.306	0.000	P

The aviation red must be per ICAO Annex 14, Volume 1, Appendix 1, Colors for Aeronautical Ground Lights, within the following chromaticity boundaries

Boundary	Line Equation	Calc.
Purple Boundary	y ≥ 0.980 - x	0.286
Yellow Boundary	y ≤ 0.335	0.306

Complies: ☑ YES ☐ NO

Tested By:	Brittany James			Signature or initials:	BJ
Engineer:	Lynette Smith			Signature or initials:	Lynette Smith
Reviewed By:	cwm			Signature or initials:	cwm
Test Equipment Used:	1, 2, 3, 4, 5, 6, 7, 8			Sample No:	CRT200203307-008
Amb (ºC):	27	RH%	17	Completion Date:	2/24/2020

Equipment list				
#	Intertek ID No.	Description	Manufacturer	Calibration Due
1	L178	100ft. Lab Goniophotometer	Labsphere	08-May-2020
2	L061	IL1700 Radiometer	International Light	14-May-2020
3	E540	Oscilloscope	Tektronix	11-Jul-2020
4	L155	Digital Protractor	Mitutoyo	03-Mar-2020
5	M244	Multimeter	Fluke	26-Mar-2020
6	L190	Hygro-Thermometer	Testo	26-Feb-2020
7	L188	Laser Distance Meter	Fluke	17-Apr-2020
8	M292	OL750S Spectroradiometer	Gooch & Housego	06-Mar-2020
Note: For measurement uncertainty, refer to the calibration certificates for all the test equipment located in the equipment files				