Hunan Lingte Technology Co., Ltd

TEST REPORT

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

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104297233CRT-001

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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-01063565-1
Phone	+0-731-8592-5707	**Test Start Date**	April 8th, 2020
Email	zds@linterk.com	**Completion Date**	April 15th, 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 Low Intensity Type B (Red Night)	Table 6-1 & Table 6-2	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.
4/7/20	CRT2004071354-001	Low Intensity Type B	Production	LT-01-LB (L)

Further Sample Description	
Type:	Low Intensity Type B Obstruction Light
Options:	None
Light Source:	[1] Red CREE LED, XP-E2
Lens:	High Borosilicate Glass, Linterk
Approx Size:	4.5" x 4" Tall
Electrical Input:	85-264Vac, 50Hz, <3W
Casting Material:	Aluminum Alloy
Mounting:	3/4" Pipe mounting

Picture(s)







Photometry - Low Intensity Obstacle Light

Energize the light by the system power supply and control unit and test for compliance with the photometric requirements in Table 6-1 and 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 Low Intensity, Type B (Red Night)

Voltage Variation	Voltage	Position	Measured	Factor	Result
Input Voltage*	85.3	(0,0)	92.3	N/A	N/A
Input Voltage +10%	290.5	(0,0)	92.3	100%	Pass
Input Voltage -10%	76.5	(0,0)	92.4	100%	Pass
* Distribution test voltage					

Luminous Intensity (cd)												
Vertical Position (deg.)	Horizontal Position (deg.)											
	-150	-120	-90	-60	-30	0	30	60	90	120	150	180
43U	13.1	13.5	15.4	12.6	14.3	10.8	10.6	11.7	11.8	13.1	12.8	13.6
42U	15.5	16.0	16.9	13.7	15.4	12.6	11.8	13.3	14.2	15.1	15.3	17.0
41U	17.2	18.8	19.0	15.7	17.2	15.1	13.5	15.2	16.6	16.5	16.9	19.5
40U	19.2	20.8	21.1	17.8	19.1	17.7	15.2	17.6	17.9	18.7	19.1	21.9
39U	21.4	23.4	21.9	19.7	21.0	20.0	17.0	19.2	19.4	21.0	21.2	23.9
38U	23.7	25.9	23.0	21.6	22.4	21.0	18.8	21.1	21.2	22.8	23.2	25.4
37U	25.9	28.1	24.2	23.9	23.9	22.7	20.9	23.0	22.4	24.8	25.1	26.5
36U	28.1	29.8	25.9	26.3	25.3	24.5	22.7	24.6	23.8	26.2	26.8	27.8
35U	29.7	31.3	27.4	28.0	26.7	25.8	24.3	25.9	24.7	27.6	28.6	28.9
34U	31.4	32.9	28.8	29.6	27.6	26.7	25.7	27.3	26.0	29.0	30.1	30.1
33U	32.4	33.9	29.7	30.7	28.7	28.1	27.0	28.8	27.5	30.2	31.4	31.2
32U	33.5	34.8	31.3	31.4	29.3	29.9	28.0	30.0	28.5	31.0	32.5	32.6
31U	34.3	35.7	32.4	31.8	29.8	31.2	29.0	31.2	30.0	31.6	33.2	33.7
30U	34.6	36.2	33.1	32.3	30.2	31.9	29.8	31.8	31.0	32.3	34.0	35.0
29U	35.0	36.9	33.6	32.3	30.6	32.7	30.7	32.5	32.1	32.7	34.3	35.5
28U	34.8	37.3	34.2	32.2	31.1	33.3	31.4	33.0	33.0	33.3	34.7	36.2
27U	34.5	37.3	33.9	31.8	31.3	34.2	31.8	33.3	33.4	33.8	34.8	36.9
26U	34.5	37.0	33.6	31.8	31.7	34.9	32.2	33.6	33.8	34.1	35.0	37.1
25U	34.3	37.1	33.8	31.6	32.0	35.2	32.7	33.8	34.3	34.4	34.7	37.1
24U	34.2	37.1	33.7	31.5	31.8	35.8	32.8	33.9	34.2	35.1	34.3	37.3
23U	34.4	37.0	34.1	31.2	32.2	35.9	33.2	34.0	34.6	35.2	34.3	37.3
22U	34.2	37.1	35.0	31.1	32.4	36.0	33.3	33.9	34.8	35.7	33.9	37.2
21U	34.1	37.6	35.4	31.1	32.4	36.6	33.8	33.9	35.4	36.4	34.3	37.1
20U	34.0	37.7	35.5	31.0	32.7	37.4	34.1	34.2	35.6	37.0	34.7	36.9
19U	34.3	37.6	35.2	31.3	32.8	38.0	34.3	34.6	36.2	37.6	35.3	37.7
18U	34.1	37.9	34.9	31.2	33.0	38.5	35.0	35.4	37.0	38.7	36.3	38.6
17U	34.7	38.8	34.4	31.6	32.8	39.1	35.7	35.9	37.9	40.0	37.4	39.5
16U	35.9	39.3	34.0	32.3	32.9	39.0	36.3	36.6	39.3	41.8	39.3	40.4
15U	36.8	39.8	33.4	32.7	33.0	38.6	37.3	37.4	41.5	43.7	41.6	42.5
14U	38.7	41.5	34.0	33.2	33.5	38.9	38.5	39.3	44.5	46.4	45.1	45.8
13U	42.8	43.6	35.0	35.0	34.1	39.6	40.6	41.6	48.1	49.6	50.1	50.0
12U	49.0	46.7	38.2	37.0	35.8	41.2	43.4	45.0	53.4	53.7	55.7	58.0
11U	55.3	51.8	43.2	40.4	39.3	44.2	47.2	50.7	62.4	59.0	61.7	62.8
10U	60.9	57.1	50.7	45.7	45.3	53.2	53.9	57.9	65.4	66.6	67.0	63.0
9U	65.6	61.6	58.3	52.4	51.9	61.2	60.4	65.5	64.4	73.0	70.2	56.7
8U	70.1	65.5	61.5	58.3	59.2	65.0	65.1	71.7	65.3	78.9	73.4	65.3
7U	72.0	69.7	60.4	64.2	67.1	65.3	69.0	76.8	74.9	83.0	75.8	75.4
6U	85.7	72.7	55.9	69.7	72.0	53.9	74.7	81.7	89.2	101.9	100.6	98.9
5U	100.8	89.6	89.0	77.8	90.0	96.7	106.1	116.7	127.3	142.8	127.6	127.4
4U	102.2	124.9	115.1	104.8	118.2	130.5	153.6	160.1	163.3	155.1	130.6	137.6
3U	105.4	133.5	115.6	119.9	135.2	166.2	163.3	166.7	167.2	132.0	116.6	126.8
2U	112.8	130.7	130.9	130.6	146.4	161.3	156.9	142.6	154.2	119.2	116.2	120.8
1U	94.0	99.6	121.4	127.2	140.7	143.5	104.9	89.2	94.0	68.2	67.9	83.7
0	50.4	71.0	81.1	78.3	82.1	96.8	62.4	52.2	52.1	41.1	48.0	52.6
1D	28.4	45.3	59.2	59.0	61.2	64.8	41.3	32.9	17.1	24.0	31.5	15.2
2D	15.2	23.6	39.2	40.9	38.8	31.9	25.4	18.4	9.3	14.2	17.8	7.1
3D	8.7	10.6	12.8	26.2	20.9	13.3	14.6	10.2	5.2	8.8	8.9	5.0
4D	6.1	6.9	8.9	13.6	11.7	8.4	8.5	6.9	3.5	6.4	5.7	4.0
Min. Between 2°-10°	60.9	57.1	50.7	45.7	45.3	53.2	53.9	57.9	64.4	66.6	67.0	56.7
Upper(°) ≥16cd	41	42	42	40	41	40	39	40	41	41	41	42
Lower(°) ≥16cd	-1	-2	-2	-3	-3	-2	-2	-2	-1	-1	-2	0
Beam Spread (°)	42.0	44.0	44.0	43.0	44.0	42.0	41.0	42.0	42.0	42.0	43.0	42.0

Complies: ☑ YES ☐ NO

Tested By:	Brittany James			Signature or initials:	
Engineer:	Lynette Smith			Signature or initials:	
Reviewed By:	cwm			Signature or initials:	
Equipment Used:	1, 2, 4, 5, 6, 7			Sample No:	CRT2004071354-001
Amb (ºC):	25	RH%	20	Completion Date:	4/14/2020

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.

Results - ICAO LED Red

Sample	Color	Input	Location	x	y	z	(P/F)
CRT2004071354-001	Red	85.3	(0,6)	0.671	0.326	0.002	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	0.309
Yellow Boundary	y ≤ 0.335	0.326

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, 3, 4, 5, 6, 7			Sample No:	CRT2004071354-001
Amb (ºC):	25	RH%	19	Completion Date:	4/15/2020

Equipment list				
#	Intertek ID No.	Description	Manufacturer	Calibration Due
1	L178	100ft. Lab Goniometer	Labsphere	08-May-2020
2	L180	100ft. Lab 0° Photodetector	Gigahertz Optik	08-May-2020
3	M292	OL750S Spectroradiometer	Gooch & Housego	02-May-2020
4	D589	Multimeter	Fluke	19-Mar-2021
5	L155	Digital Protractor	Mitutoyo	03-Sep-2020
6	M296	Stopwatch	Traceable	06-Feb-2021
7	M282	Hygro-Thermometer	Testo	05-Dec-2020
Note: For measurement uncertainty, refer to the calibration certificates for all the test equipment located in the equipment files				