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TC-6228

TEST REPORT
IES LM-79-08
Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products.

Intertek Report No......:	**ULR-TC622821000001225F**
Date of Report issue.....:	21-Oct-2021
Total number of pages.....:	12
Testing Laboratory.....:	**Intertek India Private Limited**
Address.....:	E-26, Block B1, Mohan Co-Operative Industrial Area, Mathura Road, New Delhi -110044, India
Customer / Applicant's name.....:	**R. STAHL Private Ltd.**
Address.....:	Plot No. 5, Malrosapuram Main Road | Sengundram Ind. Area | Singaperumal Koil Kancheepuram Dist | Tamilnadu | PIN 603 204 | India
Discipline.....:	Photometry
Product Group.....:	Light Sources (Electric Lamp)
Test specification:	
Standard.....:	IES LM-79-08
Non-standard test method.....:	N/A
Test Report Form No.....:	LFT-APAC-IN-OP-10p Version: 17th Jun 2020
Test item description.....:	**LED pendant light 45W,5700K, With reflector**
Trade Mark.....:	**STAHL**
Manufacturer.....:	R. STAHL Private Ltd.
Model/Type reference.....:	6057,6457- 45W
Ratings.....:	230V AC, 50Hz, 45W, 0.195A

Tested by (Name + Signature + Function).....:VIJAY KUMAR
(Engineer)

Reviewed by (Name + Signature + Function).....:HARI OM
(Technical Leader - Lighting)

An independent organization testing for safety, performance, and certification.

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General product information:
The LED Light is provided with Supply cord for supply connection.

LED Binning details: L2C5-57801205F1300

LED Details*:
Make: ----, **Model:** ----, **No. of LEDs:** ----

LED Controlgear/Driver Details*:
Make: ----, **Model:** ---, **No. of LED Drivers:** ---

COB provided with ~~Lenses~~ / Glass.....: Yes ~~/No~~.

Note:
*As declared by the Customer / Applicant.

Testing:

Date of receipt of test item.....:	29-Sep-2021
Condition of Sample Received.....:	Physically Good
Sample Identification no(s).....:	D26210929-004
Sample Serial no(s).....:	Not provided
Date (s) of performance of tests.....:	06-Oct-2021

Laboratory conditions:

Ambient Temperature.....:	25 ± 4°C
Relative humidity.....:	Less than 70 %

General remarks (If any):
The test results reported in this report relate only to the sample tested.
This report shall not be reproduced, except in full, without the written approval of report issuing testing laboratory.

Remarks:

The results tabulated in this report are representative of the actual test sample(s) submitted for this report only. The data is provided to the customer for further evaluation. Compliance to the referenced specification requirements is not determined in this report.

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SUMMARY OF TEST RESULTS		
Sr. No.	**Tests performed (name of test and test clause)**	**Verdict**
1.	Electrical and Photometric measurements (Clause 8, 9, 10 and 11)	To be evaluated by customer
2.	Colorimetric measurements (Clause 12)	To be evaluated by customer

EQUIPMENTS USED

Sr. No.	Equipment ID	Equipment name	Last calibration date	Next calibration date
1	ETL-LED-0094	High Speed Type-C Goniophotometer	Verified before use	Verified before use
2	ETL-LED-0095	Luminous Intensity Standard Lamp	05-Oct-2015	After 50Hrs. burning time
3	ETL-LED-0096	Luminous Intensity Standard Lamp	05-Oct-2015	After 50Hrs. burning time
4	ETL-LED-0097	Luminous Intensity Standard Lamp	05-Oct-2015	After 50Hrs. burning time
5	ETL-LED-0100	Digital Power Meter	12-Mar-2021	11-Mar-2022
6	ETL-LED-0105	Integrating Sphere	Verified before use	Verified before use
7	ETL-LED-0106	Spectral Flux Calibrated Standard Lamp	11-Nov-2015	After 50Hrs. burning time
8	ETL-LED-0111	Digital Power Meter	10-Jun-2021	09-Jun-2022
9	ETL-LED-0291	Humidity-cum Temperature Meter	19-Aug-2021	18-Aug-2022

Test No.01 Electrical and Photometric measurements - Distribution Method

TEST METHOD:

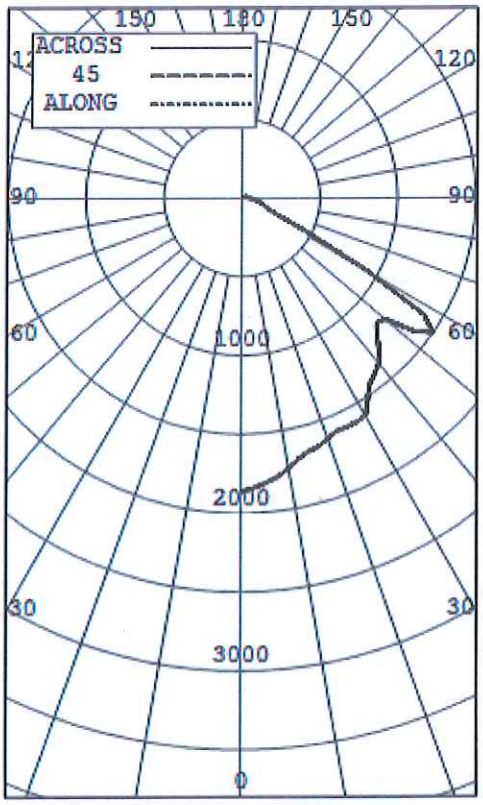
A LSI Type C High Speed Model 6440 Mirror Goniometer was used to measure the intensity (candelas) at each angle of distribution for each sample. Photometric distance was more than five times of the largest dimension of the test sample i.e. 8.63meter.
Ambient temperature was measured equal to the height of the sample mounted on the Goniometer equipment. The ambient temperature was maintained at **25±1°C** during testing.
Sample was operated at input rated voltage in its designated orientation as specified by Manufacturer.
Electrical measurements including voltage, current, and power were measured using the power meter.
Each sample was allowed to stabilize for at least thirty minutes before measurements were made. The condition of the sample tested was new. Stabilization time before testing was **30** minutes.

TEST RESULTS

Input Voltage (Vac)	Input Frequency (Hz)	Current (A)	Power (W)	Power Factor
230.11	50.0	0.194	44.48	0.997

Total Luminous Flux (lm)	Luminous Efficacy (lm/W)
5075.0	114.1

INTENSITY(CANDLEPOWER) SUMMARY:



ANGLE	MEAN CP	LMS.	ANGLE	MEAN CP	LMS.
0	1862		90	42	
5	1814	174	95	36	39
10	1742		100	31	
15	1667	472	105	18	19
20	1623		110	6	
25	1605	742	115	4	4
30	1592		120	3	
35	1435	912	125	3	2
40	1373		130	2	
45	1226	963	135	2	2
50	1204		140	3	
55	1498	1197	145	3	2
60	936		150	3	
65	236	349	155	3	1
70	147		160	4	
75	118	124	165	4	1
80	89		170	5	
85	66	72	175	5	0
90	42		180	5	

ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	1387	27.34
0-40	2299	45.30
0-60	4458	87.85
0-90	5003	98.59
40-90	2704	53.28
60-90	545	10.73
90-180	72	1.41
0-180	5075	100.00

*** THIS IS AN ABSOLUTE TEST ***

LUMINANCE SUMMARY CD./SQ.M.

ANGLE	MEAN CD/SQ M
45	398722
55	600429
65	128168
75	104913
85	173685

S/MH: 1.2
SC: 1.2

TESTED IN ACCORDANCE WITH IES PROCEDURES.

INTENSITY (CANDLEPOWER) DATA:

ANGLE	INTENSITY (CANDLEPOWER)	LUMENS
0	1862	
5	1814	174
10	1742	
15	1667	472
20	1623	
25	1605	742
30	1592	
35	1435	912
40	1373	
45	1226	963
50	1204	
55	1498	1197
60	936	
65	236	349
70	147	
75	118	124
80	89	
85	66	72
90	42	
95	36	39
100	31	
105	18	19
110	6	
115	4	4
120	3	
125	3	2
130	2	
135	2	2
140	3	
145	3	2
150	3	
155	3	1
160	4	
165	4	1
170	5	
175	5	0
180	5	

AVERAGE LUMINANCE DATA:

ANGLE	CD./SQ.M (FOOTLAMBERTS) LUMINANCE
0	426476 (124473)
30	421015 (122879)
40	410581 (119834)
45	398722 (116373)
50	428894 (125179)
55	600429 (175244)
60	428539 (125075)
65	128168 (37407)
70	98173 (28653)
75	104913 (30620)
80	118032 (34449)
85	173685 (50692)

COEFFICIENTS OF UTILIZATION:

ZONAL CAVITY METHOD

EFFECTIVE FLOOR CAVITY REFLECTANCE = .20

CC WALL	90				80				70				50			30			10			0
	70	50	30	10	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR																						
0	1.22	1.22	1.22	1.22	1.19	1.19	1.19	1.19	1.16	1.16	1.16	1.16	1.10	1.10	1.10	1.05	1.05	1.05	1.01	1.01	1.01	0.99
1	1.13	1.08	1.04	1.01	1.10	1.06	1.02	0.99	1.07	1.04	1.00	0.97	0.99	0.97	0.94	0.95	0.93	0.91	0.91	0.90	0.88	0.86
2	1.04	0.97	0.91	0.85	1.02	0.95	0.89	0.84	0.99	0.93	0.88	0.83	0.89	0.85	0.81	0.86	0.82	0.79	0.83	0.80	0.77	0.75
3	0.96	0.86	0.79	0.73	0.94	0.85	0.78	0.72	0.91	0.83	0.77	0.71	0.80	0.74	0.70	0.77	0.73	0.69	0.75	0.71	0.67	0.65
4	0.89	0.77	0.69	0.63	0.87	0.76	0.68	0.62	0.84	0.75	0.68	0.62	0.72	0.66	0.61	0.70	0.64	0.60	0.67	0.63	0.59	0.57
5	0.82	0.69	0.61	0.54	0.80	0.68	0.60	0.54	0.77	0.67	0.59	0.53	0.65	0.58	0.53	0.62	0.57	0.52	0.61	0.56	0.51	0.49
6	0.75	0.62	0.53	0.47	0.73	0.61	0.52	0.46	0.71	0.59	0.52	0.46	0.59	0.51	0.45	0.56	0.50	0.45	0.54	0.49	0.44	0.42
7	0.68	0.54	0.46	0.40	0.67	0.54	0.45	0.39	0.65	0.53	0.45	0.39	0.51	0.44	0.39	0.49	0.43	0.38	0.48	0.42	0.38	0.36
8	0.63	0.49	0.41	0.35	0.62	0.48	0.40	0.34	0.60	0.47	0.40	0.34	0.46	0.39	0.34	0.45	0.38	0.34	0.44	0.38	0.33	0.31
9	0.58	0.45	0.36	0.30	0.57	0.44	0.36	0.30	0.55	0.43	0.35	0.30	0.42	0.35	0.30	0.41	0.34	0.29	0.39	0.34	0.29	0.27
10	0.54	0.40	0.32	0.27	0.53	0.40	0.32	0.27	0.52	0.39	0.32	0.26	0.38	0.31	0.26	0.37	0.30	0.26	0.36	0.30	0.26	0.24

THE ABOVE COEFFICIENTS HAVE BEEN CALCULATED BASED ON LUMINAIRE LUMENS BECAUSE IN AN ABSOLUTE TEST THE BARE LAMP LUMENS ARE UNKNOWN. LIGHTING DESIGN CALCULATIONS MADE USING THESE COEFFICIENTS SHOULD THEREFORE USE THE LUMINAIRE LUMENS IN THE CALCULATION FORMULA.

LABORATORY RESULTS MAY NOT BE REPRESENTATIVE OF FIELD PERFORMANCE. BALLAST AND FIELD FACTORS HAVE NOT BEEN APPLIED.

TEST DISTANCE EXCEEDS FIVE TIMES THE GREATEST LUMINOUS OPENING OF LUMINAIRE.

Test No.02 Colorimetric Measurements - Integrating Sphere Method

TEST METHOD:

A Labsphere Three Meter Integrating Sphere was used to measure correlated color temperature, chromaticity coordinates and the color rendering index for each sample. 4π geometry was used.
Orientation (burning position) of product during testing was its normal burning position as specified by manufacturer.
Ambient temperature was measured at a position inside the sphere and was maintained at **25±1 °C** during testing.
Sample was allowed to stabilize for at least thirty minutes before measurements were made. The Stabilization time for the sample was **48** minutes. The condition of the sample tested was new.

Electrical measurements including voltage, current, and power were measure using the Power Meter.

The calibration of the sphere spectroradiometer system is traceable to the National Institute of Standards and Technology.

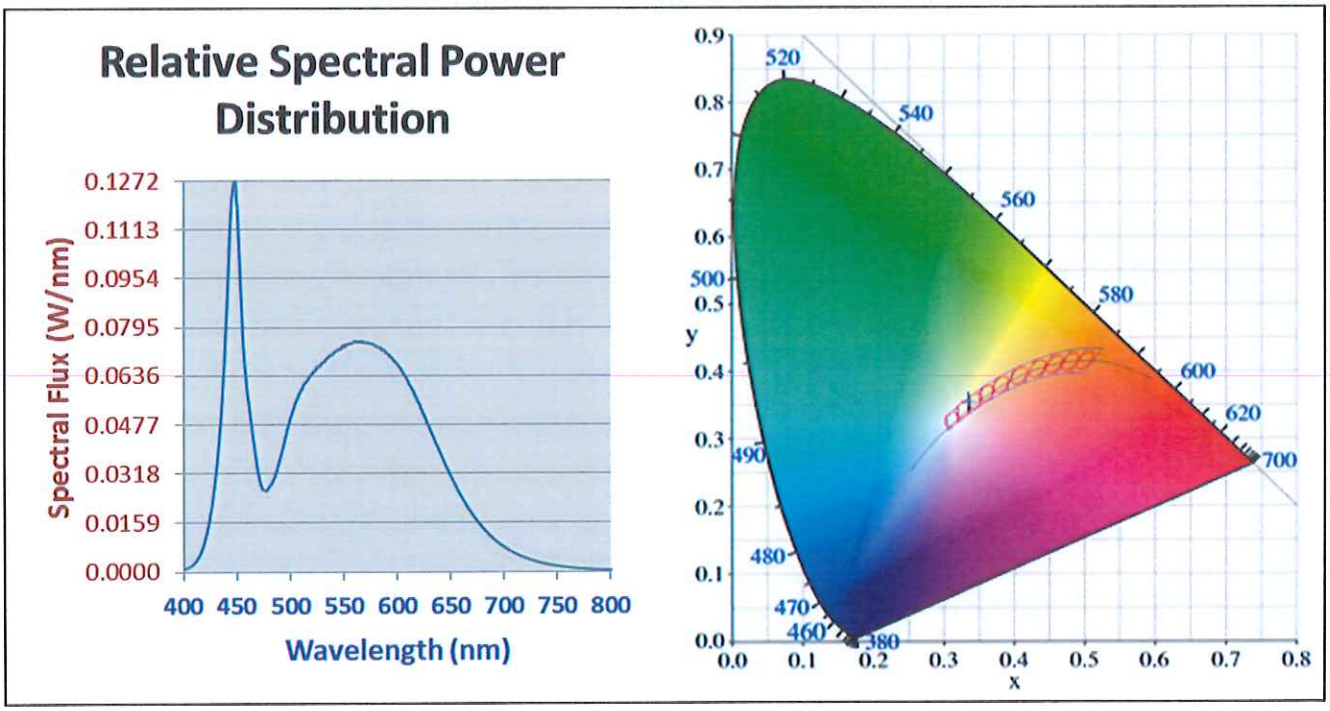
TEST RESULTS

Spectral Distribution

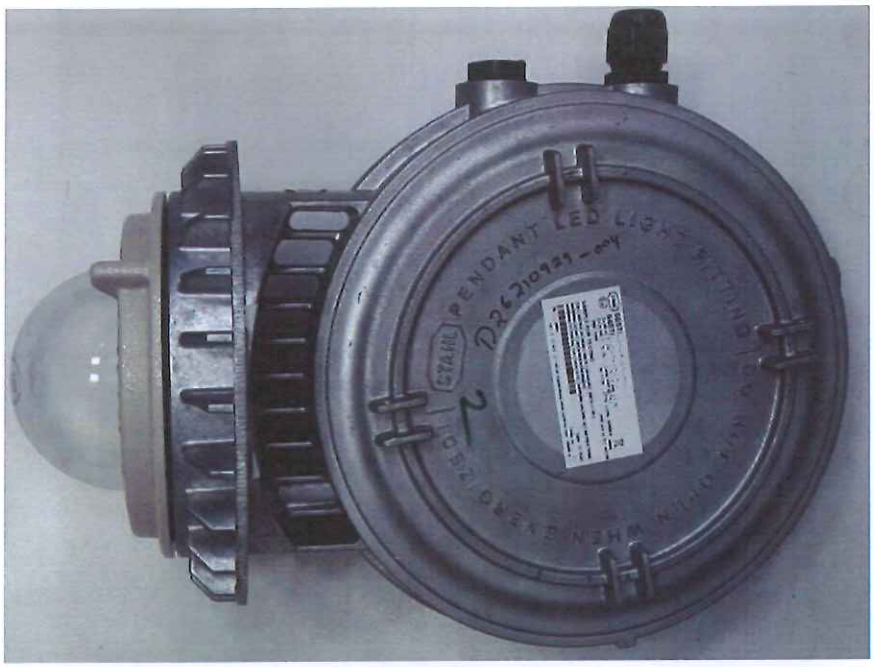
Dominant Wavelength nm	Radiant Flux	Purity	Peak Wavelength nm
557	14.812	6.644	447

CCT		CRI		x		y		Duv		u'		v'	
5417.0		79.7		0.3346		0.3540		0.0056		0.2034		0.4843	
R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14
77.1	83.4	88.9	80.7	78.7	78.3	85.5	65.2	-5.2	61.7	80.1	60.4	78.1	94.0

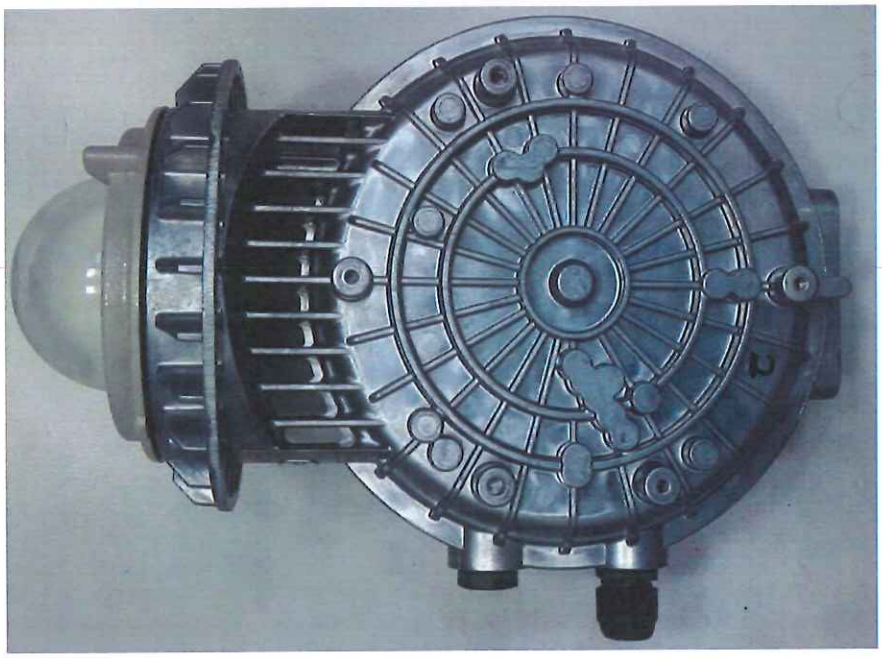
Spectral Data over Visible Wavelengths



SAMPLE PHOTOGRAPHS:



Front View



Rear View

Side View

*****End of report*****