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NVLAP TESTING
NVLAP LAB CODE 200927-0

Report No: L062111801C **Issue Date: 7/9/2021**

Report Prepared For: Whelen Aerospace Technologies
210 Airport Drive East Sebastian, FL 32958

Manufacturer: WHELEN AEROSPACE TECHNOLOGIES

Model Number: 01-0772102-10

Test: Photometric/Colorimetric/Electrical Test

Standards Used: Appropriate part or all test guidelines were used for test performed:

IESNA LM79: 2019 Approved Methods for Electrical and Photometric Measurements of Solid-State Lighting Products

ANSI NEMA ANSLG C78.377: 2017 Specification of the Chromaticity of Solid State Lighting Products

ANSI C82.77-10:2014: Harmonic Emission Limits-Related Quality Requirements for Lighting Equipment

Description of Sample: Client submitted the sample. Received in working and undamaged condition. No modifications were necessary.

Special Test Condition: 10 candela values at 5 mins interval, center measurement.

Sample Arrival Date: 6/29/21

Date of Tests: 7/1/21 - 7/8/21

Seasoning of Sample: No seasoning was performed in accordance with IESNA LM-79.

Equipment List

Equipment Used	Model No	Stock No	Calibration Due Date
Chroma Programmable AC Source	61604	PS-AC02	--
Yokogawa Digital Power Meter	WT210	MT-EL06-S4	4/7/23
HP Power Supply	6032A	PS-DC05-S2	--
Fluke Digital Thermometer	52K/J	MT-TP05	3/17/23
LLI Type C Goniophotometer System	RMG-C-MKII	CD-LL04-GC	--
LLI 2M Sphere	2MR97	CD-SN03-S2	--
LLI Spectroradiometer	SPR-3000	MT-SC01-S2	Before Use

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General Information

Manufacturer:	Whelen Aerospace Technologies
Model Number:	01-0772102-10
Driver Model Number:	N/A

Electricals and Test Results

	Input Voltage (VDC)	Input Current (A)	Input Power (W)
Intial Electrical Measurements	28.00	1.882	52.69
Final Electrical Measurements (After 45 Mins)	28.00	0.843	23.60

Time(mins)	**0**	**5**	**10**	**15**	**20**	**25**	**30**	**35**	**40**	**45**
Candela	136273	108817	85715	77846	75503	74331	73159	73661	73326	72824

Test Condition

Ambient Temperature (°C):	25.0
Total Operating Time (Hours):	0:45

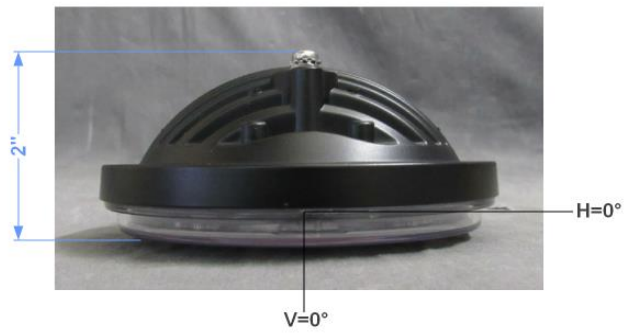

FIG. 1 LUMINAIRE

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Test Methods

Photometric Measurements - Goniophotometer

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Disclaimers:

The results related only to the samples as received and tested. This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the Federal Government.

Report Prepared by : Kunjan Modi

Test Report Reviewed by:

Steve Kang
Quality Assurance

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NVLAP TESTING
NVLAP LAB CODE 200927-0

Report No: L062111804C **Issue Date: 7/9/2021**

Report Prepared For: Whelen Aerospace Technologies
210 Airport Drive East Sebastian, FL 32958

Manufacturer: AeroLeds

Model Number: 01-1030-L-A

Test: Photometric/Colorimetric/Electrical Test

Standards Used: Appropriate part or all test guidelines were used for test performed:

IESNA LM79: 2019 Approved Methods for Electrical and Photometric Measurements of Solid-State Lighting Products

ANSI NEMA ANSLG C78.377: 2017 Specification of the Chromaticity of Solid State Lighting Products

ANSI C82.77-10:2014: Harmonic Emission Limits-Related Quality Requirements for Lighting Equipment

Description of Sample: Client submitted the sample. Received in working and undamaged condition. No modifications were necessary.

Special Test Condition: 10 candela values at 5 mins interval, center measurement.

Sample Arrival Date: 6/29/21

Date of Tests: 7/1/21 - 7/8/21

Seasoning of Sample: No seasoning was performed in accordance with IESNA LM-79.

Equipment List

Equipment Used	Model No	Stock No	Calibration Due Date
Chroma Programmable AC Source	61604	PS-AC02	--
Yokogawa Digital Power Meter	WT210	MT-EL06-S4	4/7/23
HP Power Supply	6032A	PS-DC05-S2	--
Fluke Digital Thermometer	52K/J	MT-TP05	3/17/23
LLI Type C Goniophotometer System	RMG-C-MKII	CD-LL04-GC	--
LLI 2M Sphere	2MR97	CD-SN03-S2	--
LLI Spectroradiometer	SPR-3000	MT-SC01-S2	Before Use

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General Information

Manufacturer:	AeroLeds
Model Number:	01-1030-L-A
Driver Model Number:	N/A

Electricals and Test Results

	Input Voltage (VDC)	Input Current (A)	Input Power (W)
Intial Electrical Measurements	28.00	1.384	38.75
Final Electrical Measurements (After 45 Mins)	28.02	0.729	20.44

Time(mins)	**0**	**5**	**10**	**15**	**20**	**25**	**30**	**35**	**40**	**45**
Candela	60856	50127	41744	39565	38894	38727	38391	38224	38391	38224

Test Condition

Ambient Temperature (°C):	25.0
Total Operating Time (Hours):	Please Check Total Operating Time again

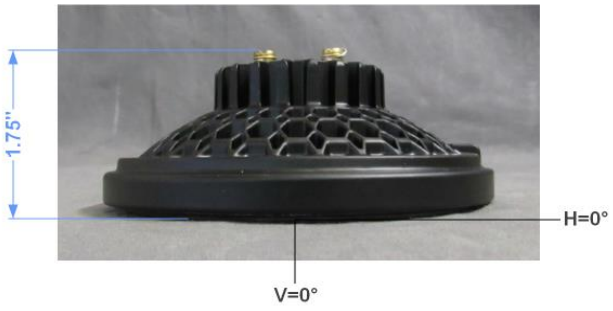

FIG. 1 LUMINAIRE

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Test Methods

Photometric Measurements - Goniophotometer

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Disclaimers:

The results related only to the samples as received and tested. This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the Federal Government.

Report Prepared by : Kunjan Modi

Test Report Reviewed by:

Steve Kang
Quality Assurance

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NVLAP TESTING
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Report No: L062111806C **Issue Date: 7/9/2021**

Report Prepared For: Whelen Aerospace Technologies
210 Airport Drive East Sebastian, FL 32958

Manufacturer: AeroLeds

Model Number: 01-1030-4596

Test: Photometric/Colorimetric/Electrical Test

Standards Used: Appropriate part or all test guidelines were used for test performed:

IESNA LM79: 2019 Approved Methods for Electrical and Photometric Measurements of Solid-State Lighting Products

ANSI NEMA ANSLG C78.377: 2017 Specification of the Chromaticity of Solid State Lighting Products

ANSI C82.77-10:2014: Harmonic Emission Limits-Related Quality Requirements for Lighting Equipment

Description of Sample: Client submitted the sample. Received in working and undamaged condition. No modifications were necessary.

Special Test Condition: 10 candela values at 5 mins interval, center measurement.

Sample Arrival Date: 6/29/21

Date of Tests: 7/1/21 - 7/8/21

Seasoning of Sample: No seasoning was performed in accordance with IESNA LM-79.

Equipment List

Equipment Used	Model No	Stock No	Calibration Due Date
Chroma Programmable AC Source	61604	PS-AC02	--
Yokogawa Digital Power Meter	WT210	MT-EL06-S4	4/7/23
HP Power Supply	6032A	PS-DC05-S2	--
Fluke Digital Thermometer	52K/J	MT-TP05	3/17/23
LLI Type C Goniophotometer System	RMG-C-MKII	CD-LL04-GC	--
LLI 2M Sphere	2MR97	CD-SN03-S2	--
LLI Spectroradiometer	SPR-3000	MT-SC01-S2	Before Use

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General Information

Manufacturer:	AeroLeds
Model Number:	01-1030-4596
Driver Model Number:	N/A

Electricals and Test Results

	Input Voltage (VDC)	Input Current (A)	Input Power (W)
Intial Electrical Measurements	28.03	3.317	92.97
Final Electrical Measurements (After 45 Mins)	28.00	1.250	34.80

Time(mins)	**0**	**5**	**10**	**15**	**20**	**25**	**30**	**35**	**40**	**45**
Candela	144177	70077	57168	53480	54150	52139	53144	51971	52642	52306

Test Condition

Ambient Temperature (°C):	25.0
Total Operating Time (Hours):	0:45

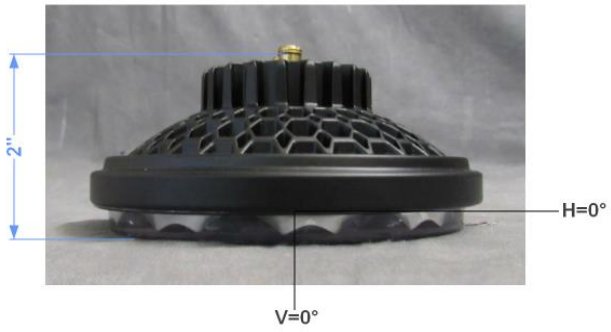

FIG. 1 LUMINAIRE

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Test Methods

Photometric Measurements - Goniophotometer

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Disclaimers:

The results related only to the samples as received and tested. This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the Federal Government.

Report Prepared by : Kunjan Modi

Test Report Reviewed by:

Steve Kang
Quality Assurance

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Report No: L062111809C **Issue Date: 7/9/2021**

Report Prepared For: Whelen Aerospace Technologies
210 Airport Drive East Sebastian, FL 32958

Manufacturer: Aveo Engineering

Model Number: H30MWSSOH-00A-Full High

Test: Photometric/Colorimetric/Electrical Test

Standards Used: Appropriate part or all test guidelines were used for test performed:

IESNA LM79: 2019 Approved Methods for Electrical and Photometric Measurements of Solid-State Lighting Products

ANSI NEMA ANSLG C78.377: 2017 Specification of the Chromaticity of Solid State Lighting Products

ANSI C82.77-10:2014: Harmonic Emission Limits-Related Quality Requirements for Lighting Equipment

Description of Sample: Client submitted the sample. Received in working and undamaged condition. No modifications were necessary.

Special Test Condition: 10 candela values at 5 mins interval, center measurement.

Sample Arrival Date: 6/29/21

Date of Tests: 7/1/21 - 7/8/21

Seasoning of Sample: No seasoning was performed in accordance with IESNA LM-79.

Equipment List

Equipment Used	Model No	Stock No	Calibration Due Date
Chroma Programmable AC Source	61604	PS-AC02	--
Yokogawa Digital Power Meter	WT210	MT-EL06-S4	4/7/23
HP Power Supply	6032A	PS-DC05-S2	--
Fluke Digital Thermometer	52K/J	MT-TP05	3/17/23
LLI Type C Goniophotometer System	RMG-C-MKII	CD-LL04-GC	--
LLI 2M Sphere	2MR97	CD-SN03-S2	--
LLI Spectroradiometer	SPR-3000	MT-SC01-S2	Before Use

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General Information

Manufacturer:	Aveo Engineering
Model Number:	H30MWSSOH-00A-Full High
Driver Model Number:	N/A

Electricals and Test Results

	Input Voltage (VDC)	Input Current (A)	Input Power (W)
Intial Electrical Measurements	28.00	2.122	59.40
Final Electrical Measurements (After 45 Mins)	28.00	1.400	39.41

Time(mins)	0	5	10	15	20	25	30	35	40	45
Candela	41409	34368	31518	29841	29003	28333	27997	27662	27662	27494

Test Condition

Ambient Temperature (°C):	25.0
Total Operating Time (Hours):	0:45

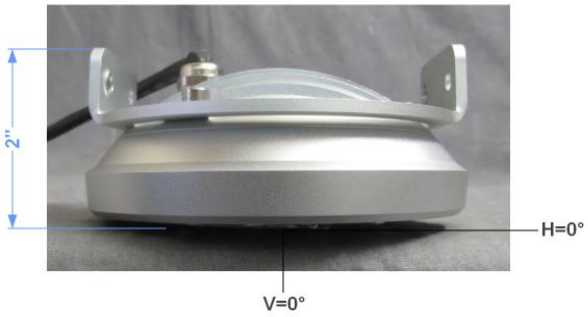

FIG. 1 LUMINAIRE

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Test Methods

Photometric Measurements - Goniophotometer

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Disclaimers:

The results related only to the samples as received and tested. This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the Federal Government.

Report Prepared by : Kunjan Modi

Test Report Reviewed by:

Steve Kang
Quality Assurance

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Report No: L062111810C **Issue Date: 7/9/2021**

Report Prepared For: Whelen Aerospace Technologies
210 Airport Drive East Sebastian, FL 32958

Manufacturer: Aero-Lites

Model Number: PAR36L204

Test: Photometric/Colorimetric/Electrical Test

Standards Used: Appropriate part or all test guidelines were used for test performed:

IESNA LM79: 2019 Approved Methods for Electrical and Photometric Measurements of Solid-State Lighting Products

ANSI NEMA ANSLG C78.377: 2017 Specification of the Chromaticity of Solid State Lighting Products

ANSI C82.77-10:2014: Harmonic Emission Limits-Related Quality Requirements for Lighting Equipment

Description of Sample: Client submitted the sample. Received in working and undamaged condition. No modifications were necessary.

Special Test Condition: 10 candela values at 5 mins interval, center measurement.

Sample Arrival Date: 6/29/21

Date of Tests: 7/1/21 - 7/8/21

Seasoning of Sample: No seasoning was performed in accordance with IESNA LM-79.

Equipment List

Equipment Used	Model No	Stock No	Calibration Due Date
Chroma Programmable AC Source	61604	PS-AC02	--
Yokogawa Digital Power Meter	WT210	MT-EL06-S4	4/7/23
HP Power Supply	6032A	PS-DC05-S2	--
Fluke Digital Thermometer	52K/J	MT-TP05	3/17/23
LLI Type C Goniophotometer System	RMG-C-MKII	CD-LL04-GC	--
LLI 2M Sphere	2MR97	CD-SN03-S2	--
LLI Spectroradiometer	SPR-3000	MT-SC01-S2	Before Use

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General Information

Manufacturer:	Aero-Lites
Model Number:	PAR36L204
Driver Model Number:	N/A

Electricals and Test Results

	Input Voltage (VDC)	Input Current (A)	Input Power (W)
Intial Electrical Measurements	28.02	1.252	35.08
Final Electrical Measurements (After 45 Mins)	28.00	0.876	24.53

Time(mins)	**0**	**5**	**10**	**15**	**20**	**25**	**30**	**35**	**40**	**45**
Candela	38727	35206	32524	31015	29674	29003	28668	28500	28333	28333

Test Condition

Ambient Temperature (°C):	25.0
Total Operating Time (Hours):	0:45

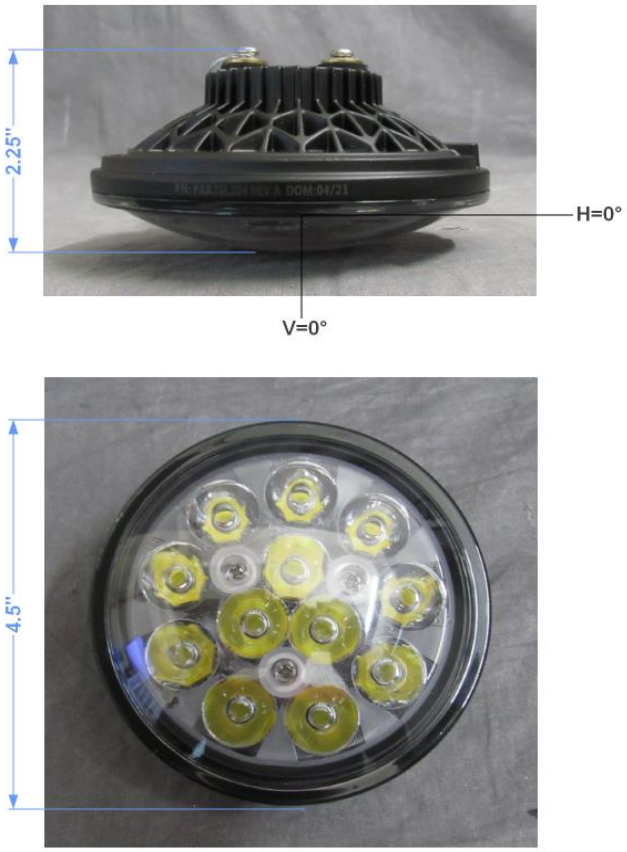

FIG. 1 LUMINAIRE

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Test Methods

Photometric Measurements - Goniophotometer

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Disclaimers:

The results related only to the samples as received and tested. This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the Federal Government.

Report Prepared by : Kunjan Modi

Test Report Reviewed by:

Steve Kang
Quality Assurance

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NVLAP TESTING
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Report No: L032310101-01 **Issue Date: 3/8/2023**

Report Prepared For: Whelen Aerospace Technologies
210 Airport Drive East Sebastian, FL 32958

Model Number: 01-1030-4509

Test: Photometric/Electrical Test

Standards Used: Appropriate part or all test guidelines were used for test performed:

IESNA LM79: 2019 Approved Methods for Electrical and Photometric Measurements of Solid-State Lighting Products

ANSI NEMA ANSLG C78.377: 2017 Specification of the Chromaticity of Solid State Lighting Products

ANSI C82.77-10:2014: Harmonic Emission Limits-Related Quality Requirements for Lighting Equipment

Description of Sample: Client submitted the sample. Received in working and undamaged condition. No modifications were necessary.

Special Test Condition: Measure Candela at center beam 5 min intervals total 45 min.

Date of Tests: 3/2/23

Seasoning of Sample: No seasoning was performed in accordance with IESNA LM-79.

Equipment List

Equipment Used	Model No	Stock No	Calibration Due Date
Chroma Programmable AC Source	61604	PS-AC02	--
Yokogawa Digital Power Meter	WT210	MT-EL06-S4	4/7/23
HP Power Supply	6032A	PS-DC05-S2	--
Fluke Digital Thermometer	52K/J	MT-TP05	3/17/23
LLI Type C Goniophotometer System	RMG-C-MKII	CD-LL04-GC	--
LLI 2M Sphere	2MR97	CD-SN03-S2	--
LLI Spectroradiometer	SPR-3000	MT-SC01-S2	Before Use

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NVLAP TESTING
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General Information	
Manufacturer:	AeroLeds, LLC
Model Number:	01-1030-4509
Driver Model Number:	N/A

Time (Min)	0	5	10	15	20	25	30	35	40	45
Candela	110959	56841	50374	49353	50204	49012	49693	49353	49183	48672

Electrical and Test Results	
Initial Electrical	14.00VDC / 5.09A / 70.30W
Final Electrical (45 min)	14.00VDC / 1.56A / 22.13W

Test Condition	
Ambient Temperature (°C):	25.0
Total Operating Time (Hours):	0:45

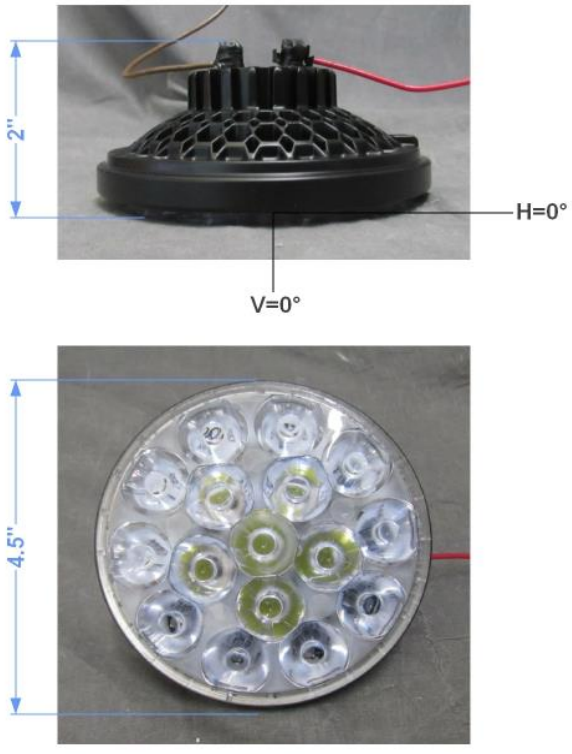

FIG. 1 LUMINAIRE

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Test Methods

Photometric Measurements - Goniophotometer

A Custom Light Laboratory Type C Rotating Mirror Goniophotometer was used to measure candelas(intensity) at each angle of distribution as defined by IESNA for the appropriate fixture type.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Spectral Measurements - Integrating Sphere

A Sensing Spectroradiometer SPR-3000, in conjunction with Light Laboratory 2 meter integrating sphere was used to measure chromaticity coordinates, correlated color temperature(CCT) and the color rendering index(CRI) for each sample.

Ambient temperature is set to 25°C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25°C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Disclaimers:

The results related only to the samples as received and tested. This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the Federal Government.

Report Prepared by : Kunjan Modi

Test Report Reviewed by:

Steve Kang
Quality Assurance