

LM-79-08 Test Report

For

LIGHT EFFICIENT DESIGN

188 S. Northwest Highway Cary, IL 60013, USA

Direct Linear Ambient Luminaires

Model Name(s):

RP-LBI-G1-2F-9W-XXK-WC-[Blank, OCN]-[BAA, Blank]

Representative (Tested) Model:

RP-LBI-G1-2F-9W-XXK-WC

Model Difference:

1. WC represents power adjustable and color tunable, wattage can adjust 6W, 9W and 12W, color tunable 2700K, 3000K and 3500K.
2. [Blank, OCN] represent sensor option, OCN represents occupancy sensor and N can be a number 1 to 4 for sensor number, Blank represents without sensor.
3. [BAA, Blank] is for business purpose.
4. All construction is the same, except the function.

Prepare by :

Review by:

Engineer: Derek Lai

Date: 2019-11-19

Technical Lead: Vincent Yuan

Issue Date: 2019-11-

Revised Date: N/A

Note:

1. The results contained in this report pertain only to the tested samples.
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3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency of the Federal Government.

Laboratory: Dongguan New Testing Centre Co., Ltd

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Tel: 86-769-89874553

Website: <http://www.ntc-cert.com>

Product Information:

| | |
|------------------------|-----------------------------------|
| Client Name: | LIGHT EFFICIENT DESIGN |
| Brand Name: | REMPHOS OR LIGHT EFFICIENT DESIGN |
| Model Number: | RP-LBI-G1-2F-9W-XXK-WC |
| Product Type: | Direct Linear Ambient Luminaires |
| Rating Input: | 100-277Vac, 50/60Hz, 9W |
| Declared CCT: | 2700K/3000K/3500K |
| Declared Light Output: | 1100 lm |
| LED Manufacturer: | Hongli Zhihui Group Co., Ltd. |
| LED Model: | HL-AS-PU2835DW-S1-08-PCT-HR3 |
| LED Quantity: | 64 pcs |

Test Information:

| | |
|------------------------------|--|
| Standard Lamp: | Total Spectral Radiant Flux Standard Lamp, trace to NIST. 1. D908S for Gonio 2. D215S for Integrating Sphere |
| Date of Receipt Samples: | 2019-11-06 |
| Quantity of Receipt Samples: | 1 pcs |
| Sample Number: | 191106001-S1 |

Laboratory Information:

| | |
|----------------------------|--|
| Test Laboratory: | Dongguan New Testing Centre Co., Ltd |
| Laboratory Address: | 3F, No. 1 the 1 st North Industry Road, Songshan Lake Science & Technology Park, Dongguan, Guangdong, China |
| Laboratory Contact Name: | Neil Zhong |
| Laboratory Contact E-mail: | Neil_ntc@163.com |

Report Information:

| | |
|------------------------------|---------------|
| Issued Date of Test Report: | 2019-11- |
| Revised Date of Test Report: | N/A |
| Test Report No.: | NTCLR19110159 |
| Remark (If applicable): | N/A |

| Test Specification: | |
|----------------------------|---|
| Date of Test | 2019-11-08 |
| Test Item | 1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate 7. THD and PF |
| Reference Standard | IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products ANSI C78.377-2017 Specifications for the Chromaticity of Solid State Lighting Products CIE 13.3-1995 Method of Measuring and Specifying Color Rendering Properties of Light Sources CIE 15-2004 Technical Report Colorimetry |

| Test Methods: |
|---|
| <p>1. Photometric and Electrical Measurements – Light Distribution Method:</p> <p>Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at $25\text{ }^{\circ}\text{C} \pm 1^{\circ}\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample. The sample was operated at required Voltage and Frequency. It was stabilized before measurement was made. Luminous Flux, Luminaire Efficacy and Zonal Lumen were calculated from the software taken at 1° vertical intervals and 15° horizontal intervals.</p> |
| <p>2. Photometric and Electrical Measurements – Integrating Sphere Method:</p> <p>Photometric parameters were measured using an integrating sphere, as spectroradiometer and software. The ambient temperature condition inside the sphere was measured at $25\text{ }^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. The sample was operated at require Voltage and Frequency. It was stabilized before measurement was made. Chromaticity Coordinates, Correlated Color Temperature and Color Rendering Index were calculated from the spectral radiant flux measurements taken at least 1 nm intervals over the rage of 380 to 780 nm.</p> |
| <p>3. THD and PF Measurements:</p> <p>The sample was tested according to the ANSI C82.77-2002, the sample was operated at requirement Voltage and Frequency, and was stabilized before measurement. The Total Harmonic Distortion was calculated from the Digital Power Meter.</p> |

Integrating Sphere Test Results:

Test Condition:

| Test Ambient (°C) | Test Humidity (%) | Orientation | Stabilization Time (minute) | Test Time (minute) |
|-------------------|-------------------|-------------|-----------------------------|--------------------|
| 25.3 | 41.9 | Face Down | 90 | 10 |

Electrical Data:

| Voltage (V) | Frequency (Hz) | Current (A) | Wattage (W) | Power Factor |
|-------------|----------------|-------------|-------------|--------------|
| 120.0 | 60 | 0.07400 | 8.804 | 0.9912 |
| 277.0 | 60 | 0.03510 | 9.129 | 0.9401 |

Output Data:

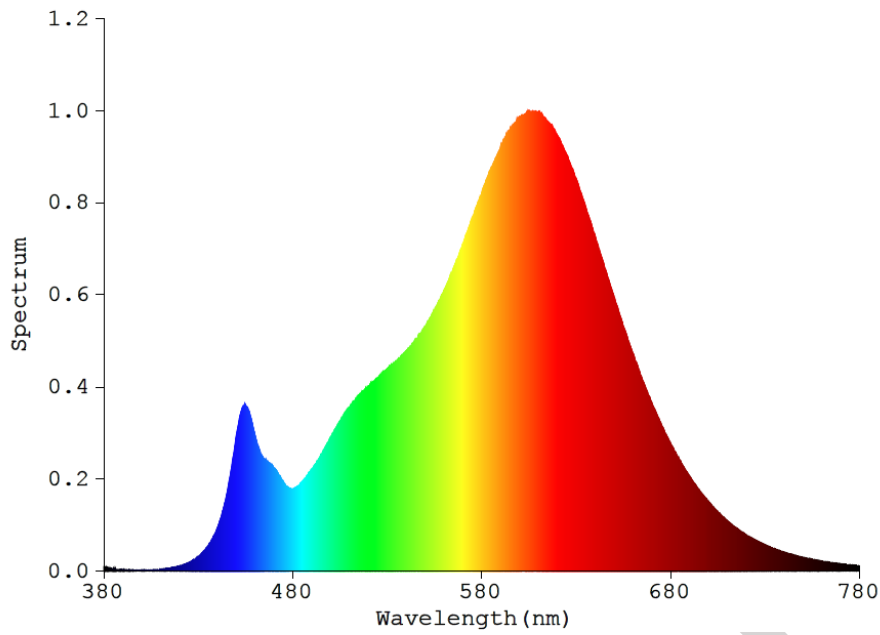
| Light Output (lm) | Efficacy (lm/W) |
|-------------------|-----------------|
| 1124.5 | 127.73 |
| 1121.4 | 122.84 |

Color Data:

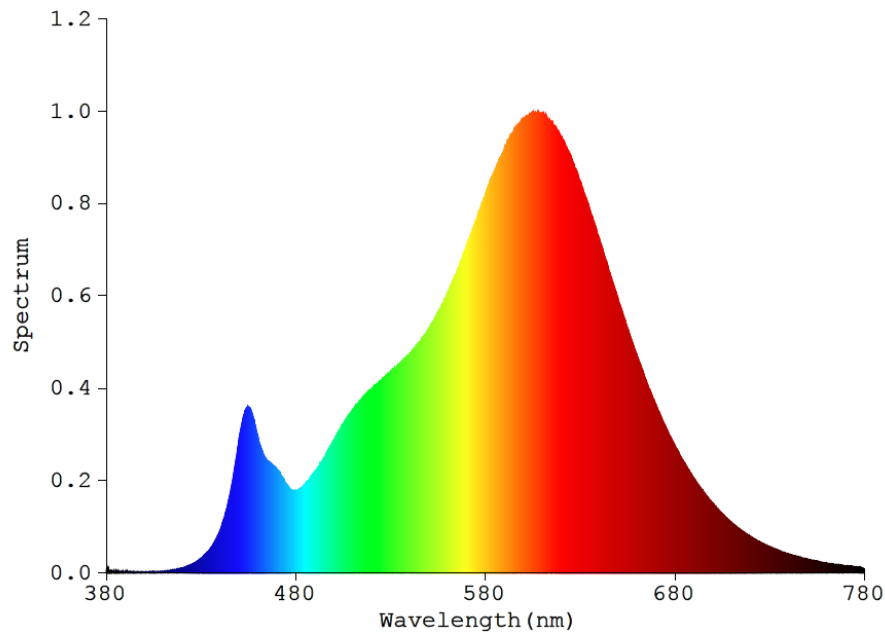
| Parameter | Result at 120V | Result at 277V |
|------------------|----------------|----------------|
| CCT(K) | 2737 | 2731 |
| Ra | 82.6 | 82.5 |
| R9 | 6 | 6 |
| Chromaticity, x | 0.4604 | 0.4608 |
| Chromaticity, y | 0.4164 | 0.4162 |
| Chromaticity, u' | 0.2603 | 0.2606 |
| Chromaticity, v' | 0.5296 | 0.5296 |
| Duv | 0.00207 | 0.00197 |

| Special Color Rendering | | | | | |
|-------------------------|----------------|----------------|-----|----------------|----------------|
| | Result at 120V | Result at 277V | | Result at 120V | Result at 277V |
| R1 | 81 | 81 | R9 | 6 | 6 |
| R2 | 92 | 92 | R10 | 84 | 84 |
| R3 | 94 | 94 | R11 | 81 | 80 |
| R4 | 80 | 80 | R12 | 75 | 75 |
| R5 | 82 | 82 | R13 | 84 | 84 |
| R6 | 93 | 93 | R14 | 97 | 97 |
| R7 | 81 | 81 | R15 | 72 | 72 |
| R8 | 57 | 56 | - | - | - |

Spectrum Diagram (Result at 120V):



Spectrum Diagram (Result at 277V):



Goniophotometer Test Results:

Test Condition:

| Test Ambient (°C) | Test Humidity (%) | Orientation | Stabilization Time (minute) | Test Time (minute) |
|-------------------|-------------------|-------------|-----------------------------|--------------------|
| 25.3 | 41.9 | Face Down | 90 | 25 |

Electrical Data:

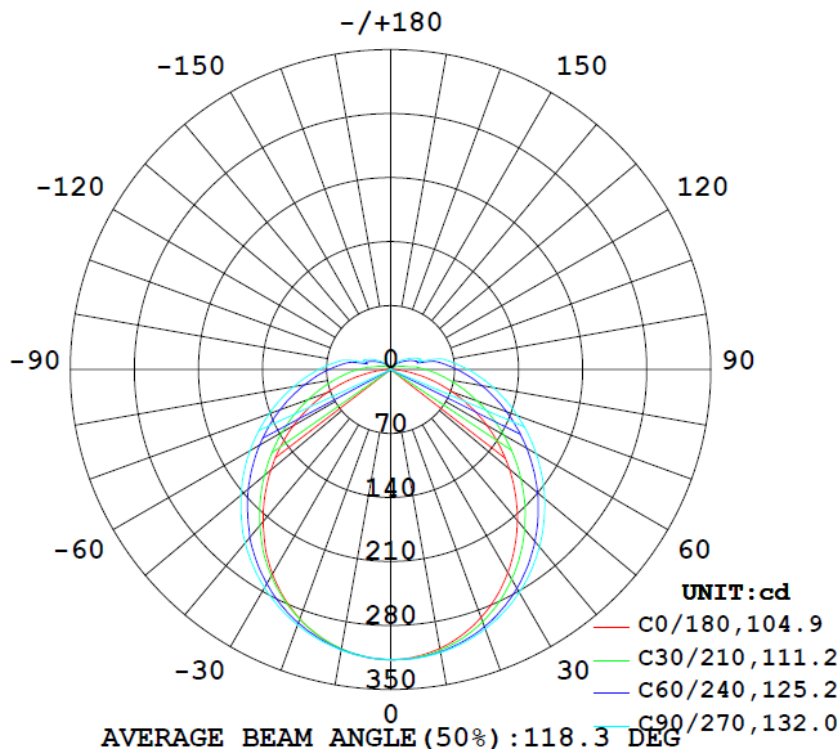
| Voltage (V) | Frequency (Hz) | Current (A) | Wattage (W) | Power Factor |
|-------------|----------------|-------------|-------------|--------------|
| 120.0 | 60 | 0.07400 | 8.804 | 0.9912 |
| 277.0 | 60 | 0.03510 | 9.129 | 0.9401 |

Goniophotometer Data:

| Parameter | Results at 120V | Results at 277V |
|-----------------------------------|-----------------|-----------------|
| Total Luminous (lm) | 1124.5 | 1121.4 |
| Total Luminous per foot (lm/ft) | 562.25 | 560.70 |
| Luminous Efficacy (lm/w) | 127.73 | 122.84 |
| Zonal Lumens Distribution (0-60°) | 64.4% | |
| Beam Angle (°) | 118.3 | |

Luminous Intensity Distribution Diagram (Result at 120V):

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM

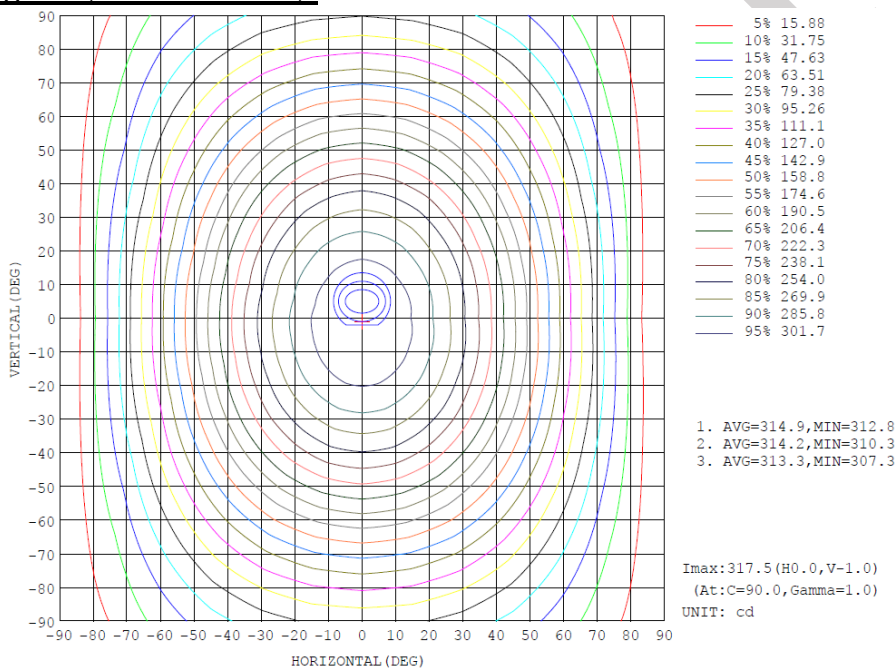


Zonal Flux Diagram (Result at 120V):

ZONAL FLUX DIAGRAM:

| γ | C0 | C45 | C90 | C135 | C180 | C225 | C270 | C315 | γ | φ zone | φ total | lum, lamp |
|-----|--|--------|--------|--------|--------|--------|--------|--------|---------|---------|---------|-----------|
| 10 | 309.7 | 312.7 | 314.2 | 312.5 | 310.5 | 310.2 | 311.5 | 310.5 | 0- 10 | 30.01 | 30.01 | 2.67,2.67 |
| 20 | 288.7 | 296.9 | 302.0 | 296.3 | 290.3 | 292.5 | 297.4 | 292.9 | 10- 20 | 85.89 | 115.9 | 10.3,10.3 |
| 30 | 256.3 | 271.1 | 281.3 | 270.1 | 258.3 | 265.2 | 275.7 | 265.6 | 20- 30 | 130.2 | 246.1 | 21.9,21.9 |
| 40 | 215.5 | 237.2 | 253.1 | 235.7 | 216.9 | 230.9 | 247.5 | 231.2 | 30- 40 | 157.4 | 403.5 | 35.9,35.9 |
| 50 | 169.6 | 198.1 | 219.8 | 196.5 | 171.1 | 192.1 | 213.6 | 192.2 | 40- 50 | 165.3 | 568.8 | 50.6,50.6 |
| 60 | 121.1 | 157.9 | 183.6 | 156.2 | 122.7 | 152.1 | 177.6 | 152.0 | 50- 60 | 155.3 | 724.1 | 64.4,64.4 |
| 70 | 71.78 | 119.5 | 147.5 | 117.8 | 73.98 | 114.0 | 141.3 | 113.6 | 60- 70 | 131.3 | 855.5 | 76.1,76.1 |
| 80 | 27.20 | 85.73 | 114.1 | 84.26 | 29.03 | 80.22 | 107.6 | 79.54 | 70- 80 | 99.53 | 955.0 | 84.9,84.9 |
| 90 | 3.719 | 58.53 | 84.68 | 57.27 | 3.339 | 53.74 | 78.71 | 52.90 | 80- 90 | 68.12 | 1023 | 91,91 |
| 100 | 2.936 | 35.10 | 61.28 | 33.26 | 2.628 | 28.56 | 55.97 | 28.48 | 90-100 | 44.61 | 1068 | 95,95 |
| 110 | 0.8554 | 20.79 | 34.57 | 21.48 | 2.348 | 19.58 | 31.13 | 17.78 | 100-110 | 24.17 | 1092 | 97.1,97.1 |
| 120 | 0.0563 | 13.24 | 24.72 | 13.74 | 2.021 | 12.26 | 22.02 | 11.09 | 110-120 | 15.15 | 1107 | 98.4,98.4 |
| 130 | 0.0752 | 8.116 | 16.00 | 8.738 | 1.693 | 7.965 | 14.38 | 5.923 | 120-130 | 9.041 | 1116 | 99.3,99.3 |
| 140 | 0.1022 | 4.863 | 9.796 | 5.434 | 1.380 | 4.969 | 8.613 | 3.846 | 130-140 | 4.911 | 1121 | 99.7,99.7 |
| 150 | 0.1290 | 2.750 | 5.330 | 3.189 | 1.074 | 3.000 | 4.481 | 2.341 | 140-150 | 2.339 | 1123 | 99.9,99.9 |
| 160 | 0.1573 | 1.292 | 2.513 | 1.740 | 0.7779 | 1.343 | 2.295 | 0.8204 | 150-160 | 0.9394 | 1124 | 100,100 |
| 170 | 0.1754 | 0.1776 | 0.1782 | 0.2160 | 0.4442 | 0.3162 | 0.2626 | 0.2752 | 160-170 | 0.2061 | 1125 | 100,100 |
| 180 | 0.2159 | 0.2126 | 0.2089 | 0.2118 | 0.2157 | 0.2136 | 0.2103 | 0.2139 | 170-180 | 0.0218 | 1125 | 100,100 |
| DEG | LUMINOUS INTENSITY:cd Less than 35% Percent = 20.1 % | | | | | | | | | UNIT:lm | | |

Isocandela Diagram (Result at 120V):



Luminous Distribution Intensity Data (Result at 120V):

Table--1

UNIT: cd

| C (DEG) | 0 | 15 | 30 | 45 | 60 | 75 | 90 | 105 | 120 | 135 | 150 | 165 | 180 | 195 | 210 | 225 | 240 | 255 | 270 |
|---------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Y (DEG) | 0 | 317 | 317 | 317 | 317 | 317 | 317 | 317 | 317 | 317 | 317 | 317 | 317 | 317 | 317 | 317 | 317 | 317 | 317 |
| 5 | 315 | 316 | 316 | 316 | 317 | 317 | 317 | 317 | 317 | 316 | 316 | 316 | 316 | 315 | 315 | 315 | 315 | 315 | 315 |
| 10 | 310 | 311 | 312 | 313 | 313 | 314 | 314 | 314 | 313 | 312 | 311 | 311 | 310 | 310 | 310 | 310 | 311 | 311 | 312 |
| 15 | 301 | 303 | 304 | 306 | 308 | 309 | 309 | 307 | 306 | 303 | 302 | 302 | 301 | 302 | 303 | 304 | 305 | 305 | 305 |
| 20 | 289 | 292 | 294 | 297 | 299 | 302 | 302 | 301 | 299 | 296 | 293 | 291 | 290 | 289 | 291 | 292 | 295 | 297 | 297 |
| 25 | 274 | 277 | 280 | 285 | 289 | 292 | 293 | 292 | 288 | 284 | 280 | 276 | 274 | 277 | 280 | 284 | 286 | 287 | 287 |
| 30 | 256 | 261 | 265 | 271 | 276 | 280 | 281 | 280 | 275 | 270 | 264 | 259 | 258 | 257 | 261 | 265 | 271 | 274 | 276 |
| 35 | 237 | 242 | 247 | 255 | 262 | 267 | 268 | 266 | 261 | 254 | 246 | 241 | 239 | 238 | 243 | 249 | 256 | 260 | 262 |
| 40 | 216 | 221 | 228 | 237 | 245 | 252 | 253 | 251 | 244 | 236 | 226 | 219 | 217 | 217 | 222 | 231 | 240 | 245 | 248 |
| 45 | 193 | 199 | 207 | 218 | 228 | 235 | 237 | 234 | 227 | 216 | 206 | 197 | 194 | 195 | 202 | 212 | 221 | 228 | 231 |
| 50 | 170 | 176 | 186 | 198 | 210 | 217 | 220 | 216 | 208 | 196 | 184 | 174 | 171 | 172 | 180 | 192 | 203 | 211 | 214 |
| 55 | 146 | 153 | 164 | 178 | 191 | 199 | 202 | 198 | 190 | 176 | 162 | 151 | 147 | 148 | 159 | 172 | 184 | 193 | 196 |
| 60 | 121 | 130 | 143 | 158 | 172 | 180 | 184 | 180 | 171 | 156 | 141 | 127 | 123 | 125 | 137 | 152 | 165 | 175 | 178 |
| 65 | 96.3 | 106 | 121 | 138 | 153 | 162 | 165 | 162 | 152 | 137 | 119 | 104 | 98.2 | 101 | 116 | 133 | 147 | 156 | 159 |
| 70 | 71.8 | 83.5 | 101 | 120 | 135 | 144 | 147 | 144 | 134 | 118 | 98.8 | 81.1 | 74.0 | 78.9 | 96.0 | 114 | 129 | 138 | 141 |
| 75 | 48.4 | 62.2 | 81.9 | 102 | 118 | 127 | 130 | 127 | 117 | 100 | 79.8 | 59.8 | 50.5 | 58.1 | 77.6 | 96.1 | 111 | 121 | 124 |
| 80 | 27.2 | 43.4 | 65.1 | 85.7 | 101 | 111 | 114 | 111 | 100 | 84.3 | 63.2 | 41.1 | 29.0 | 40.0 | 61.2 | 80.2 | 95.4 | 105 | 108 |
| 85 | 10.8 | 28.2 | 50.6 | 71.2 | 86.3 | 95.9 | 98.5 | 95.6 | 85.4 | 69.9 | 48.9 | 26.2 | 12.1 | 25.6 | 47.2 | 66.1 | 80.8 | 89.4 | 92.5 |
| 90 | 3.72 | 17.9 | 38.8 | 58.5 | 73.0 | 82.1 | 84.7 | 81.8 | 72.2 | 57.3 | 37.2 | 16.2 | 3.34 | 15.8 | 35.8 | 53.7 | 67.7 | 75.8 | 78.7 |
| 95 | 3.42 | 11.5 | 29.5 | 47.7 | 61.3 | 69.9 | 72.3 | 69.7 | 60.6 | 46.6 | 28.2 | 10.3 | 2.72 | 10.1 | 27.0 | 43.4 | 56.4 | 64.0 | 66.6 |
| 100 | 2.94 | 7.55 | 19.3 | 35.1 | 51.0 | 59.0 | 61.3 | 58.8 | 50.4 | 33.3 | 19.0 | 6.78 | 2.63 | 6.86 | 18.3 | 28.6 | 46.5 | 53.5 | 56.0 |
| 105 | 2.00 | 5.37 | 14.7 | 25.2 | 29.7 | 34.6 | 37.3 | 33.9 | 28.9 | 25.7 | 15.2 | 5.29 | 2.49 | 5.35 | 14.6 | 23.7 | 26.8 | 29.5 | 32.4 |
| 110 | 0.86 | 3.76 | 11.1 | 20.8 | 28.3 | 33.2 | 34.6 | 33.4 | 28.8 | 21.5 | 11.7 | 4.36 | 2.35 | 4.42 | 11.3 | 19.6 | 26.0 | 29.9 | 31.1 |
| 115 | 0.22 | 2.60 | 8.45 | 16.8 | 23.7 | 28.3 | 29.7 | 28.4 | 23.9 | 17.3 | 9.41 | 3.70 | 2.19 | 3.76 | 8.90 | 15.5 | 21.6 | 25.3 | 26.6 |
| 120 | 0.06 | 1.90 | 6.50 | 13.2 | 19.2 | 23.5 | 24.7 | 23.5 | 19.5 | 13.7 | 7.62 | 3.26 | 2.02 | 3.31 | 7.22 | 12.3 | 17.7 | 20.9 | 22.0 |
| 125 | 0.06 | 1.48 | 5.01 | 10.4 | 15.4 | 19.2 | 20.1 | 19.3 | 15.8 | 11.0 | 6.22 | 2.90 | 1.85 | 2.91 | 5.86 | 10.0 | 14.3 | 16.8 | 18.0 |
| 130 | 0.08 | 1.20 | 3.91 | 8.12 | 12.1 | 15.3 | 16.0 | 15.4 | 12.6 | 8.74 | 5.13 | 2.58 | 1.69 | 2.61 | 4.83 | 7.96 | 11.4 | 13.3 | 14.4 |
| 135 | 0.09 | 1.00 | 3.07 | 6.31 | 9.59 | 12.0 | 12.5 | 12.1 | 10.1 | 6.92 | 4.19 | 2.22 | 1.54 | 2.08 | 4.02 | 6.03 | 9.05 | 10.6 | 11.3 |
| 140 | 0.10 | 0.49 | 2.43 | 4.86 | 7.33 | 9.18 | 9.80 | 9.27 | 7.84 | 5.43 | 3.42 | 1.53 | 1.38 | 1.36 | 3.34 | 4.97 | 6.66 | 7.91 | 8.61 |
| 145 | 0.12 | 0.19 | 1.96 | 3.69 | 5.50 | 6.86 | 7.33 | 6.94 | 6.00 | 4.21 | 2.77 | 1.10 | 1.23 | 1.17 | 2.72 | 3.85 | 5.13 | 5.67 | 5.89 |
| 150 | 0.13 | 0.17 | 1.47 | 2.75 | 4.03 | 5.00 | 5.33 | 5.05 | 4.44 | 3.19 | 2.21 | 0.92 | 1.07 | 1.02 | 2.17 | 3.00 | 3.96 | 4.28 | 4.48 |
| 155 | 0.15 | 0.16 | 0.84 | 1.97 | 2.87 | 3.52 | 3.75 | 3.55 | 3.13 | 2.40 | 1.43 | 0.76 | 0.93 | 0.88 | 1.08 | 2.33 | 2.95 | 3.20 | 3.34 |
| 160 | 0.16 | 0.17 | 0.19 | 1.29 | 1.90 | 2.37 | 2.51 | 2.38 | 2.10 | 1.74 | 0.56 | 0.61 | 0.78 | 0.74 | 0.67 | 1.34 | 2.05 | 2.18 | 2.30 |
| 165 | 0.16 | 0.17 | 0.18 | 0.19 | 0.87 | 1.38 | 1.47 | 1.43 | 0.94 | 0.34 | 0.42 | 0.47 | 0.62 | 0.59 | 0.54 | 0.44 | 0.49 | 0.97 | 1.11 |
| 170 | 0.18 | 0.17 | 0.18 | 0.18 | 0.18 | 0.18 | 0.17 | 0.17 | 0.22 | 0.27 | 0.31 | 0.44 | 0.41 | 0.37 | 0.32 | 0.27 | 0.27 | 0.26 | 0.26 |
| 175 | 0.20 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.20 | 0.26 | 0.26 | 0.25 | 0.25 | 0.24 | 0.25 | 0.24 |
| 180 | 0.22 | 0.22 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.22 | 0.22 | 0.22 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 |

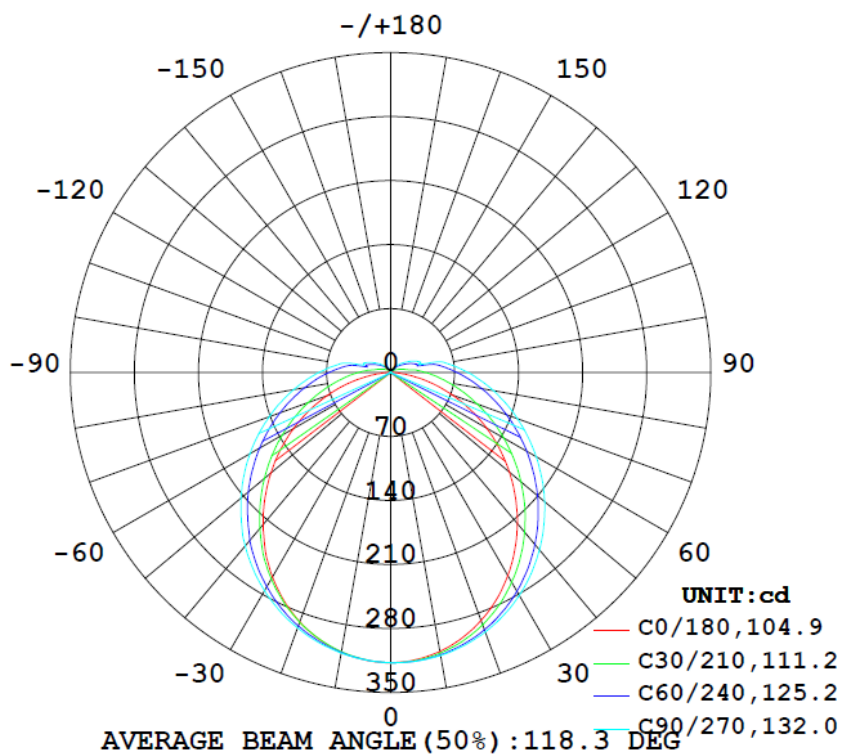
Table--2

UNIT: cd

| C (DEG) | 285 | 300 | 315 | 330 | 345 | | | | | | | | | | | | | | |
|---------|------|------|------|------|------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Y (DEG) | 0 | 317 | 317 | 317 | 317 | | | | | | | | | | | | | | |
| 5 | 315 | 315 | 315 | 315 | 315 | | | | | | | | | | | | | | |
| 10 | 311 | 311 | 311 | 310 | 310 | | | | | | | | | | | | | | |
| 15 | 305 | 304 | 303 | 302 | 301 | | | | | | | | | | | | | | |
| 20 | 296 | 295 | 293 | 291 | 290 | | | | | | | | | | | | | | |
| 25 | 286 | 284 | 280 | 277 | 275 | | | | | | | | | | | | | | |
| 30 | 274 | 271 | 266 | 261 | 258 | | | | | | | | | | | | | | |
| 35 | 260 | 256 | 249 | 244 | 239 | | | | | | | | | | | | | | |
| 40 | 245 | 240 | 231 | 223 | 218 | | | | | | | | | | | | | | |
| 45 | 228 | 221 | 212 | 202 | 196 | | | | | | | | | | | | | | |
| 50 | 211 | 203 | 192 | 181 | 173 | | | | | | | | | | | | | | |
| 55 | 193 | 184 | 172 | 159 | 150 | | | | | | | | | | | | | | |
| 60 | 174 | 165 | 152 | 137 | 126 | | | | | | | | | | | | | | |
| 65 | 156 | 146 | 132 | 116 | 103 | | | | | | | | | | | | | | |
| 70 | 138 | 128 | 114 | 95.8 | 79.7 | | | | | | | | | | | | | | |
| 75 | 121 | 111 | 95.5 | 77.1 | 58.4 | | | | | | | | | | | | | | |
| 80 | 104 | 94.9 | 79.5 | 60.5 | 39.7 | | | | | | | | | | | | | | |
| 85 | 89.0 | 80.3 | 65.3 | 46.3 | 25.0 | | | | | | | | | | | | | | |
| 90 | 75.5 | 67.1 | 52.9 | 34.8 | 15.1 | | | | | | | | | | | | | | |
| 95 | 63.6 | 55.8 | 42.5 | 26.0 | 9.77 | | | | | | | | | | | | | | |
| 100 | 53.1 | 45.8 | 28.5 | 16.7 | 6.45 | | | | | | | | | | | | | | |
| 105 | 29.9 | 27.7 | 21.9 | 12.7 | 3.21 | | | | | | | | | | | | | | |
| 110 | 29.3 | 25.1 | 17.8 | 9.48 | 2.63 | | | | | | | | | | | | | | |
| 115 | 25.0 | 20.9 | 14.1 | 6.97 | 1.37 | | | | | | | | | | | | | | |
| 120 | 20.5 | 17.0 | 11.1 | 3.64 | 1.48 | | | | | | | | | | | | | | |
| 125 | 16.5 | 13.5 | 8.13 | 3.85 | 1.20 | | | | | | | | | | | | | | |
| 130 | 13.0 | 10.6 | 5.92 | 3.07 | 0.93 | | | | | | | | | | | | | | |
| 135 | 10.4 | 7.33 | 5.10 | 2.55 | 0.48 | | | | | | | | | | | | | | |
| 140 | 7.42 | 5.75 | 3.85 | 2.07 | 0.25 | | | | | | | | | | | | | | |
| 145 | 5.40 | 4.49 | 3.01 | 1.68 | 0.26 | | | | | | | | | | | | | | |
| 150 | 4.28 | 3.36 | 2.34 | 1.15 | 0.26 | | | | | | | | | | | | | | |
| 155 | 3.02 | 2.47 | 1.73 | 0.33 | 0.28 | | | | | | | | | | | | | | |
| 160 | 2.13 | 1.71 | 0.82 | 0.30 | 0.29 | | | | | | | | | | | | | | |
| 165 | 0.88 | 0.34 | 0.30 | 0.29 | 0.29 | | | | | | | | | | | | | | |
| 170 | 0.27 | 0.27 | 0.28 | 0.27 | 0.27 | | | | | | | | | | | | | | |
| 175 | 0.25 | 0.24 | 0.24 | 0.25 | 0.25 | | | | | | | | | | | | | | |
| 180 | 0.21 | 0.21 | 0.21 | 0.21 | 0.22 | | | | | | | | | | | | | | |

Luminous Intensity Distribution Diagram (Result at 277V):

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM

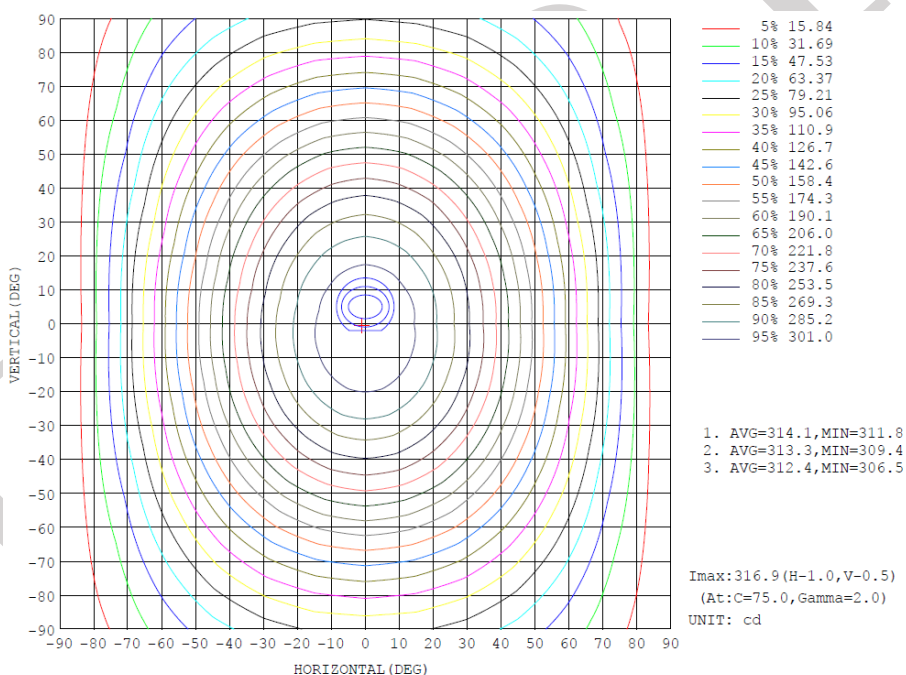


Zonal Flux Diagram (Result at 277V):

ZONAL FLUX DIAGRAM:

| γ | C0 | C45 | C90 | C135 | C180 | C225 | C270 | C315 | γ | Φ zone | Φ total | lum, lamp |
|-----|--|--------|--------|--------|--------|--------|--------|--------|---------|---------|---------|-----------|
| 10 | 309.1 | 311.8 | 313.4 | 311.6 | 309.4 | 309.4 | 310.6 | 309.6 | 0- 10 | 29.93 | 29.93 | 2.67,2.67 |
| 20 | 288.4 | 296.1 | 301.1 | 295.5 | 288.9 | 291.7 | 296.6 | 292.0 | 10- 20 | 85.65 | 115.6 | 10.3,10.3 |
| 30 | 256.3 | 270.3 | 280.5 | 269.4 | 256.9 | 264.6 | 274.9 | 264.8 | 20- 30 | 129.8 | 245.4 | 21.9,21.9 |
| 40 | 215.8 | 236.5 | 252.4 | 235.0 | 215.5 | 230.3 | 246.9 | 230.5 | 30- 40 | 157.0 | 402.3 | 35.9,35.9 |
| 50 | 169.9 | 197.4 | 219.1 | 195.9 | 169.8 | 191.6 | 212.9 | 191.6 | 40- 50 | 164.9 | 567.2 | 50.6,50.6 |
| 60 | 121.6 | 157.4 | 183.1 | 155.8 | 121.5 | 151.6 | 177.0 | 151.5 | 50- 60 | 154.9 | 722.1 | 64.4,64.4 |
| 70 | 72.45 | 119.1 | 147.2 | 117.5 | 72.88 | 113.7 | 140.9 | 113.2 | 60- 70 | 131.0 | 853.1 | 76.1,76.1 |
| 80 | 27.78 | 85.41 | 113.8 | 84.01 | 28.27 | 80.03 | 107.2 | 79.32 | 70- 80 | 99.25 | 952.3 | 84.9,84.9 |
| 90 | 3.727 | 58.30 | 84.46 | 57.11 | 3.186 | 53.63 | 78.44 | 52.74 | 80- 90 | 67.94 | 1020 | 91,91 |
| 100 | 2.949 | 34.83 | 61.13 | 33.23 | 2.615 | 28.63 | 55.75 | 28.41 | 90-100 | 44.49 | 1065 | 95,95 |
| 110 | 0.8893 | 20.70 | 34.49 | 21.41 | 2.333 | 19.53 | 31.03 | 17.73 | 100-110 | 24.10 | 1089 | 97.1,97.1 |
| 120 | 0.0553 | 13.19 | 24.66 | 13.71 | 2.007 | 12.24 | 21.94 | 11.05 | 110-120 | 15.11 | 1104 | 98.4,98.4 |
| 130 | 0.0736 | 8.083 | 15.97 | 8.712 | 1.682 | 7.949 | 14.33 | 5.890 | 120-130 | 9.016 | 1113 | 99.3,99.3 |
| 140 | 0.1009 | 4.848 | 9.775 | 5.421 | 1.369 | 4.957 | 8.574 | 3.833 | 130-140 | 4.897 | 1118 | 99.7,99.7 |
| 150 | 0.1254 | 2.736 | 5.318 | 3.180 | 1.066 | 2.995 | 4.460 | 2.333 | 140-150 | 2.332 | 1120 | 99.9,99.9 |
| 160 | 0.1551 | 1.279 | 2.508 | 1.736 | 0.7707 | 1.347 | 2.285 | 0.8141 | 150-160 | 0.9364 | 1121 | 100,100 |
| 170 | 0.1757 | 0.1762 | 0.1779 | 0.2157 | 0.4344 | 0.3147 | 0.2621 | 0.2745 | 160-170 | 0.2052 | 1121 | 100,100 |
| 180 | 0.2140 | 0.2116 | 0.2060 | 0.2116 | 0.2158 | 0.2123 | 0.2092 | 0.2141 | 170-180 | 0.0217 | 1121 | 100,100 |
| DEG | LUMINOUS INTENSITY:cd Less than 35% Percent = 20.1 % | | | | | | | | | UNIT:lm | | |

Isocandela Diagram (Result at 277V):



Luminous Distribution Intensity Data (Result at 277V):

Table--1

UNIT: cd

| C (DEG) | 0 | 15 | 30 | 45 | 60 | 75 | 90 | 105 | 120 | 135 | 150 | 165 | 180 | 195 | 210 | 225 | 240 | 255 | 270 |
|---------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| γ (DEG) | 0 | 316 | 316 | 316 | 316 | 316 | 316 | 316 | 316 | 316 | 316 | 316 | 316 | 316 | 316 | 316 | 316 | 316 | 316 |
| 5 | 315 | 315 | 315 | 316 | 316 | 316 | 316 | 316 | 316 | 315 | 315 | 315 | 315 | 314 | 314 | 314 | 314 | 314 | 315 |
| 10 | 309 | 310 | 311 | 312 | 313 | 313 | 313 | 313 | 312 | 312 | 310 | 310 | 309 | 309 | 309 | 309 | 310 | 310 | 311 |
| 15 | 300 | 302 | 303 | 305 | 307 | 308 | 308 | 307 | 305 | 303 | 301 | 301 | 300 | 301 | 302 | 303 | 304 | 305 | |
| 20 | 288 | 291 | 293 | 296 | 299 | 301 | 301 | 301 | 298 | 295 | 292 | 290 | 289 | 288 | 290 | 292 | 294 | 296 | 297 |
| 25 | 274 | 277 | 280 | 284 | 288 | 291 | 292 | 291 | 287 | 284 | 279 | 275 | 274 | 273 | 276 | 279 | 283 | 285 | 287 |
| 30 | 256 | 260 | 264 | 270 | 275 | 280 | 280 | 279 | 275 | 269 | 263 | 259 | 257 | 256 | 260 | 265 | 270 | 273 | 275 |
| 35 | 237 | 242 | 247 | 254 | 261 | 266 | 267 | 266 | 260 | 253 | 245 | 240 | 237 | 237 | 242 | 248 | 255 | 259 | 262 |
| 40 | 216 | 220 | 227 | 236 | 245 | 251 | 252 | 250 | 244 | 235 | 226 | 218 | 216 | 216 | 222 | 230 | 239 | 244 | 247 |
| 45 | 193 | 198 | 207 | 217 | 227 | 234 | 236 | 233 | 226 | 216 | 205 | 196 | 193 | 194 | 201 | 211 | 221 | 228 | 230 |
| 50 | 170 | 176 | 186 | 197 | 209 | 216 | 219 | 216 | 208 | 196 | 184 | 173 | 170 | 171 | 180 | 192 | 202 | 211 | 213 |
| 55 | 146 | 153 | 164 | 177 | 190 | 198 | 201 | 198 | 189 | 176 | 162 | 150 | 146 | 148 | 158 | 172 | 184 | 192 | 195 |
| 60 | 122 | 129 | 142 | 157 | 171 | 180 | 183 | 179 | 170 | 156 | 140 | 127 | 121 | 124 | 137 | 152 | 165 | 174 | 177 |
| 65 | 96.9 | 106 | 121 | 138 | 153 | 162 | 165 | 161 | 151 | 136 | 119 | 103 | 97.1 | 101 | 116 | 132 | 146 | 156 | 159 |
| 70 | 72.4 | 83.4 | 101 | 119 | 134 | 144 | 147 | 143 | 133 | 118 | 98.5 | 80.8 | 72.9 | 78.6 | 95.7 | 114 | 128 | 138 | 141 |
| 75 | 49.1 | 62.1 | 81.8 | 102 | 117 | 127 | 130 | 126 | 116 | 100 | 79.6 | 59.6 | 49.5 | 57.9 | 77.3 | 95.9 | 111 | 121 | 124 |
| 80 | 27.8 | 43.3 | 65.0 | 85.4 | 101 | 111 | 114 | 110 | 99.9 | 84.0 | 63.0 | 41.0 | 28.3 | 39.8 | 61.0 | 80.0 | 95.1 | 104 | 107 |
| 85 | 11.3 | 28.1 | 50.6 | 71.0 | 86.1 | 95.6 | 98.3 | 95.2 | 85.1 | 69.7 | 48.7 | 26.1 | 11.6 | 25.5 | 47.0 | 65.9 | 80.6 | 89.1 | 92.1 |
| 90 | 3.73 | 17.8 | 38.7 | 58.3 | 72.8 | 81.9 | 84.5 | 81.5 | 72.0 | 57.1 | 37.1 | 16.1 | 3.19 | 15.7 | 35.7 | 53.6 | 67.5 | 75.7 | 78.4 |
| 95 | 3.42 | 11.5 | 29.4 | 47.5 | 61.1 | 69.7 | 72.1 | 69.4 | 60.4 | 46.5 | 28.1 | 10.2 | 2.71 | 10.1 | 26.9 | 43.3 | 56.2 | 63.8 | 66.4 |
| 100 | 2.95 | 7.53 | 19.3 | 34.8 | 50.9 | 58.8 | 61.1 | 58.6 | 50.3 | 33.2 | 18.9 | 6.76 | 2.61 | 6.82 | 18.2 | 28.6 | 46.3 | 53.4 | 55.8 |
| 105 | 2.03 | 5.36 | 14.7 | 25.1 | 39.6 | 44.5 | 37.4 | 33.7 | 28.8 | 25.6 | 15.1 | 5.27 | 2.48 | 5.32 | 14.6 | 23.6 | 36.7 | 43.3 | 45.2 |
| 110 | 0.89 | 3.76 | 11.1 | 20.7 | 32.2 | 33.1 | 34.5 | 33.2 | 28.7 | 21.4 | 11.6 | 4.35 | 2.33 | 4.40 | 11.3 | 19.5 | 25.9 | 29.8 | 31.0 |
| 115 | 0.24 | 2.59 | 8.44 | 16.7 | 23.6 | 28.2 | 29.6 | 28.2 | 23.8 | 17.2 | 9.37 | 3.69 | 2.17 | 3.74 | 8.86 | 15.5 | 21.5 | 25.3 | 26.5 |
| 120 | 0.06 | 1.90 | 6.49 | 13.2 | 19.2 | 23.4 | 24.7 | 23.4 | 19.5 | 13.7 | 7.59 | 3.25 | 2.01 | 3.29 | 7.19 | 12.2 | 17.6 | 20.8 | 21.9 |
| 125 | 0.06 | 1.47 | 5.00 | 10.4 | 15.3 | 19.2 | 20.0 | 19.2 | 15.7 | 11.0 | 6.20 | 2.88 | 1.84 | 2.90 | 5.84 | 9.99 | 14.2 | 16.8 | 18.0 |
| 130 | 0.07 | 1.20 | 3.90 | 8.08 | 12.0 | 15.3 | 16.0 | 15.4 | 12.5 | 8.71 | 5.10 | 2.57 | 1.68 | 2.60 | 4.81 | 7.95 | 11.4 | 13.3 | 14.3 |
| 135 | 0.09 | 1.00 | 3.06 | 6.28 | 9.57 | 11.9 | 12.5 | 12.0 | 10.1 | 6.90 | 4.18 | 2.21 | 1.52 | 2.06 | 4.01 | 6.01 | 9.02 | 10.6 | 11.2 |
| 140 | 0.10 | 0.49 | 2.42 | 4.85 | 7.32 | 9.15 | 9.78 | 9.23 | 7.82 | 5.42 | 3.41 | 1.52 | 1.37 | 1.35 | 3.32 | 4.96 | 6.65 | 7.88 | 8.57 |
| 145 | 0.11 | 0.19 | 1.96 | 3.68 | 5.49 | 6.84 | 7.32 | 6.92 | 5.98 | 4.20 | 2.76 | 1.09 | 1.22 | 1.17 | 2.71 | 3.84 | 5.11 | 5.65 | 5.86 |
| 150 | 0.13 | 0.17 | 1.47 | 2.74 | 4.02 | 4.98 | 5.32 | 5.03 | 4.43 | 3.18 | 2.20 | 0.91 | 1.07 | 1.01 | 2.16 | 2.99 | 3.95 | 4.27 | 4.46 |
| 155 | 0.14 | 0.16 | 0.84 | 1.96 | 2.86 | 3.51 | 3.74 | 3.53 | 3.12 | 2.39 | 1.43 | 0.76 | 0.92 | 0.87 | 1.07 | 2.33 | 2.94 | 3.19 | 3.33 |
| 160 | 0.16 | 0.17 | 0.19 | 1.28 | 1.89 | 2.36 | 2.51 | 2.37 | 2.10 | 1.74 | 0.56 | 0.61 | 0.77 | 0.73 | 0.67 | 1.35 | 2.05 | 2.18 | 2.28 |
| 165 | 0.16 | 0.17 | 0.18 | 0.19 | 0.87 | 1.37 | 1.47 | 1.42 | 0.94 | 0.34 | 0.42 | 0.47 | 0.62 | 0.59 | 0.53 | 0.44 | 0.49 | 0.96 | 1.11 |
| 170 | 0.18 | 0.17 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.17 | 0.17 | 0.22 | 0.27 | 0.31 | 0.43 | 0.41 | 0.37 | 0.31 | 0.26 | 0.26 | 0.26 |
| 175 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.20 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.24 | 0.25 | 0.24 |
| 180 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 | 0.21 |

Table--2

UNIT: cd

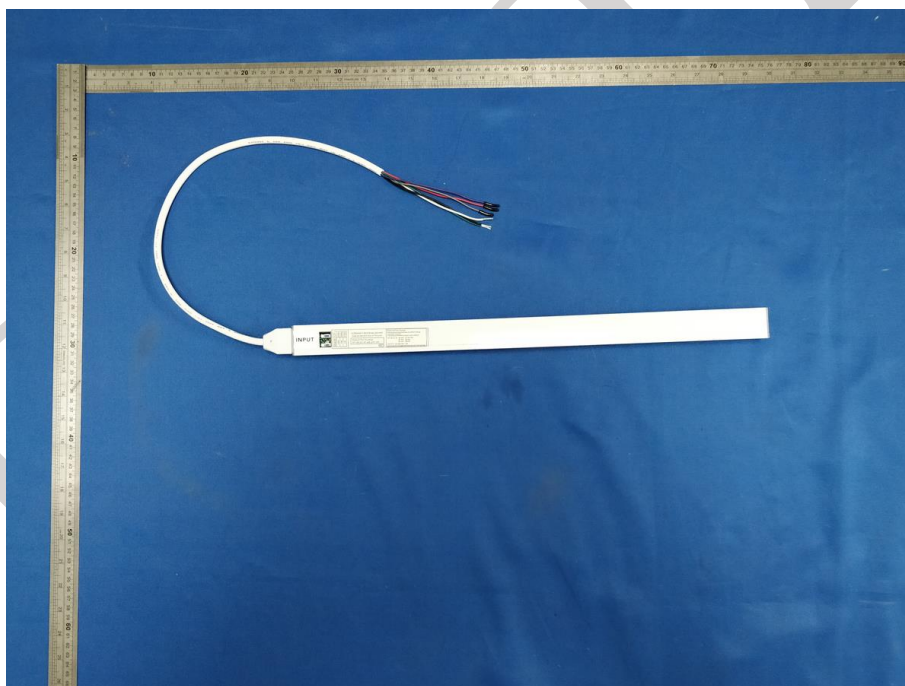
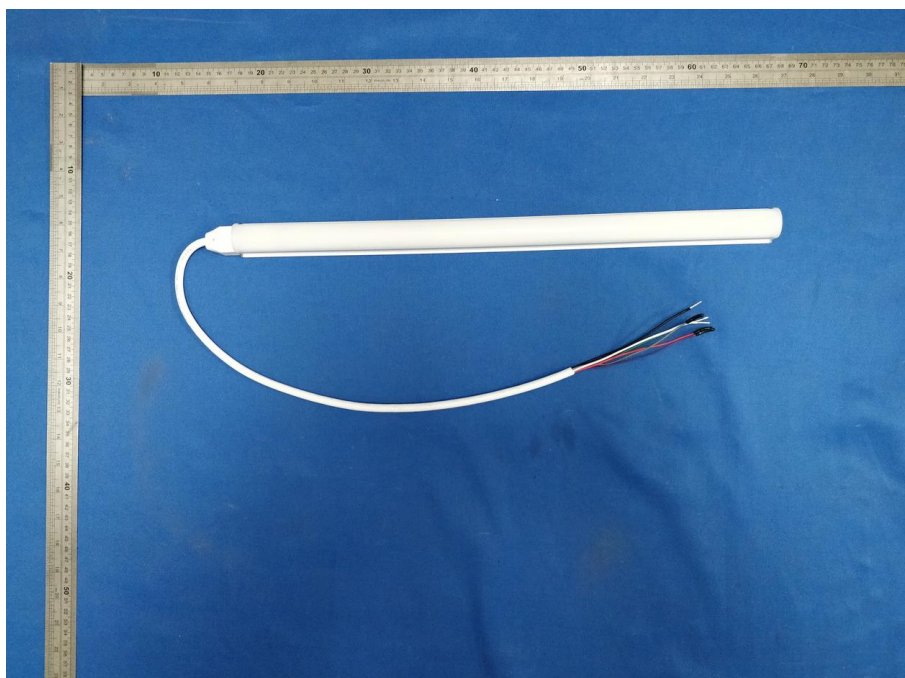
| C (DEG) | 285 | 300 | 315 | 330 | 345 | | | | | | | | | | | | | | |
|---------|------|------|------|------|------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| γ (DEG) | 0 | 316 | 316 | 316 | 316 | | | | | | | | | | | | | | |
| 5 | 314 | 315 | 314 | 315 | 315 | | | | | | | | | | | | | | |
| 10 | 310 | 310 | 310 | 309 | 309 | | | | | | | | | | | | | | |
| 15 | 304 | 303 | 302 | 301 | 301 | | | | | | | | | | | | | | |
| 20 | 296 | 294 | 292 | 290 | 289 | | | | | | | | | | | | | | |
| 25 | 285 | 283 | 280 | 277 | 274 | | | | | | | | | | | | | | |
| 30 | 273 | 270 | 265 | 261 | 257 | | | | | | | | | | | | | | |
| 35 | 259 | 255 | 248 | 243 | 238 | | | | | | | | | | | | | | |
| 40 | 244 | 239 | 230 | 223 | 218 | | | | | | | | | | | | | | |
| 45 | 228 | 221 | 212 | 202 | 196 | | | | | | | | | | | | | | |
| 50 | 210 | 202 | 192 | 180 | 173 | | | | | | | | | | | | | | |
| 55 | 192 | 184 | 172 | 159 | 149 | | | | | | | | | | | | | | |
| 60 | 174 | 165 | 151 | 137 | 126 | | | | | | | | | | | | | | |
| 65 | 156 | 146 | 132 | 116 | 102 | | | | | | | | | | | | | | |
| 70 | 138 | 128 | 113 | 95.6 | 79.5 | | | | | | | | | | | | | | |
| 75 | 120 | 111 | 95.2 | 77.0 | 58.2 | | | | | | | | | | | | | | |
| 80 | 104 | 94.6 | 79.3 | 60.4 | 39.6 | | | | | | | | | | | | | | |
| 85 | 88.8 | 80.0 | 65.1 | 46.2 | 24.9 | | | | | | | | | | | | | | |
| 90 | 75.3 | 66.9 | 52.7 | 34.8 | 15.1 | | | | | | | | | | | | | | |
| 95 | 63.4 | 55.6 | 42.4 | 26.0 | 9.75 | | | | | | | | | | | | | | |
| 100 | 53.0 | 45.7 | 28.4 | 16.6 | 6.44 | | | | | | | | | | | | | | |
| 105 | 30.0 | 27.7 | 21.8 | 12.7 | 3.21 | | | | | | | | | | | | | | |
| 110 | 29.3 | 25.0 | 17.7 | 9.47 | 2.62 | | | | | | | | | | | | | | |
| 115 | 24.9 | 20.9 | 14.1 | 6.96 | 1.37 | | | | | | | | | | | | | | |
| 120 | 20.5 | 16.9 | 11.1 | 3.60 | 1.47 | | | | | | | | | | | | | | |
| 125 | 16.4 | 13.5 | 8.12 | 3.84 | 1.19 | | | | | | | | | | | | | | |
| 130 | 13.0 | 10.6 | 5.89 | 3.07 | 0.93 | | | | | | | | | | | | | | |
| 135 | 10.3 | 7.31 | 5.08 | 2.54 | 0.47 | | | | | | | | | | | | | | |
| 140 | 7.40 | 5.73 | 3.83 | 2.07 | 0.25 | | | | | | | | | | | | | | |
| 145 | 5.39 | 4.48 | 3.00 | 1.67 | 0.25 | | | | | | | | | | | | | | |
| 150 | 4.27 | 3.35 | 2.33 | 1.15 | 0.26 | | | | | | | | | | | | | | |
| 155 | 3.01 | 2.47 | 1.72 | 0.33 | 0.27 | | | | | | | | | | | | | | |
| 160 | 2.13 | 1.70 | 0.81 | 0.30 | 0.29 | | | | | | | | | | | | | | |
| 165 | 0.89 | 0.34 | 0.30 | 0.29 | 0.29 | | | | | | | | | | | | | | |
| 170 | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 | | | | | | | | | | | | | | |
| 175 | 0.24 | 0.24 | 0.24 | 0.25 | 0.25 | | | | | | | | | | | | | | |
| 180 | 0.21 | 0.21 | 0.21 | 0.21 | 0.22 | | | | | | | | | | | | | | |

THD and PF Measurement Test Results (Test for 2700K):

Electrical Measurement:

| Voltage (V) | Frequency (Hz) | Current (A) | Wattage (W) | Power Factor | iTHD(%) |
|-------------|----------------|-------------|-------------|--------------|---------|
| 277.0 | 60 | 0.03510 | 9.129 | 0.9401 | 14.17 |

Photo of Sample:



Equipment List:

| Equipment ID | Equipment Name | Last Cal. | Due Cal. |
|--------------|------------------------------|------------|------------|
| NTC-F01-001 | Goniophotometer System | 2018-11-16 | 2019-11-15 |
| NTC-F01-006 | 2.0 meter Integrating Sphere | 2018-11-16 | 2019-11-15 |
| NTC-F01-012 | Standard Lamp | 2018-11-13 | 2019-11-12 |
| NTC-F01-013 | Standard Lamp | 2018-11-13 | 2019-11-12 |
| NTC-F01-031 | Digital Power Meter | 2019-08-22 | 2020-08-21 |
| NTC-F01-019 | Temperature & Humidity Meter | 2018-11-12 | 2019-11-11 |

*****End of Report*****

Draft