

Project Number
20.00776



HUBBELL
Lighting

Date
6/25/2020

Photometric Test Report

LAB #5
Sphere

Test Sample Description

Catalog Number: P350209-031-30
Description: Acrylic Cylinder Flush Mount Ceiling

After 3 hours, stabilization was not met per LM-79-08.

Photometry

IES LM-46-04

Test Method:

Preburn Time: 0:30
Time To Stabilize: 3:00
Total Operating Time: 4:08

Input Voltage (Volts): 120.1
Input Current (Amps): 0.209
Input Wattage (Watts): 24.1
Ambient Temp (°C): 26.3

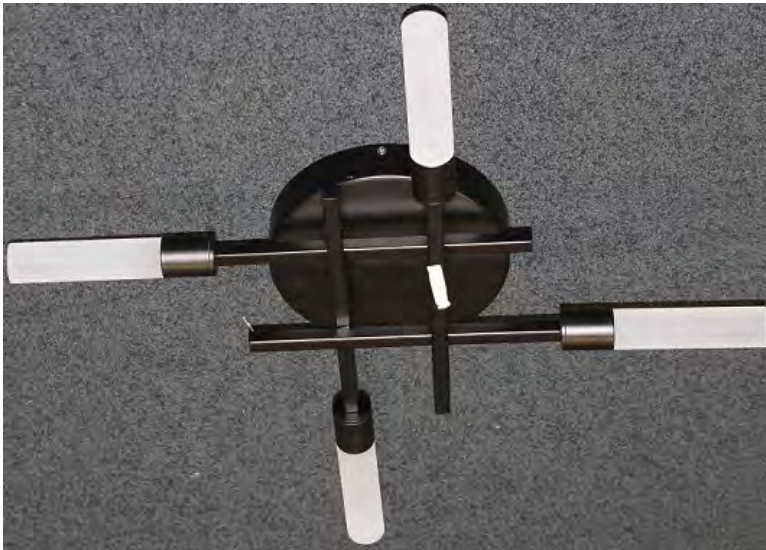
Sphere

IES LM-16-93

Test Method: IES LM-79-08 §12.1

Preburn Time: 17:10
Time To Stabilize: 1:49
Total Operating Time: 19:26

Input Voltage (Volts): 120.0
Input Current (Amps): 0.206
Input Wattage (Watts): 23.9
Ambient Temp (°C): 24
PF @ 120V: 0.965
THD @ 120V (%): 17.3



Hubbell Lighting, Inc.

701 Millennium Boulevard
Greenville, SC 29607
www.hubbellighting.com

Checked (sphere): M. ELLMANN
Checked (photometry): M. OLALDE
Approved: L. GENNETTEN



* This customer-provided information was not verified by the laboratory. Note that LED manufacturer and part # are unverifiable by the lab.

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This report shall not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.



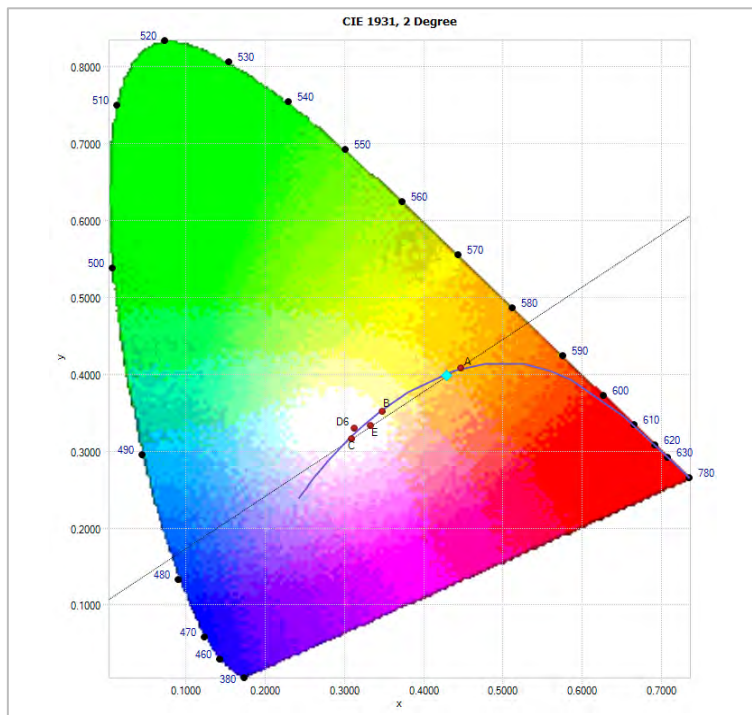
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Lamp Cat#: BXEN-30G-13H-9B
 Lamp Desc: 32 - Bridgelux 3000K LEDs
 Driver Desc: 1 - Jintop JT-03-600-24-40
 Programmed to 600mA

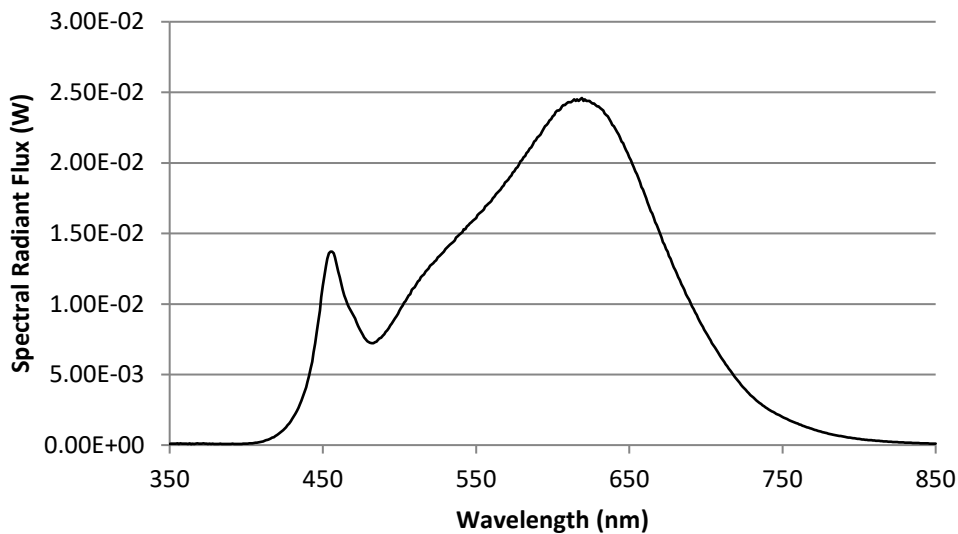
Efficacy: 52.8 LPW S/P Ratio: 1.5 LM/LM

Spectral Results

| Name | Value | Unit |
|----------------------|------------|--------|
| Φ | 4.39 | watts |
| $\Phi(v)$ | 1261 | lumens |
| $\Phi(v')$ | 1858 | lm' |
| Chrom x | 0.4294 | |
| Chrom y | 0.3986 | |
| Chrom u | 0.248 | |
| Chrom v | 0.3454 | |
| Duv | 0.0017 | |
| Chrom u' | 0.248 | |
| Chrom v' | 0.5181 | |
| CCT | 3084 | K |
| Purity | 48.5 | % |
| λ (dom) | 582.9 | nm |
| FWHM | 163.9 | nm |
| λ (peak) | 619 | nm |
| λ (center) | 598.7 | nm |
| λ (centroid) | 591.6 | nm |
| SDCM | Cool White | |
| RA | 93 | |
| Corr. Coef. | 0.00112581 | |
| Correlation | 0.0054 | |
| R1 | 93.0 | |
| R2 | 97.6 | |
| R3 | 98.1 | |
| R4 | 91.3 | |
| R5 | 92.6 | |
| R6 | 96.1 | |
| R7 | 90.7 | |
| R8 | 80.9 | |
| R9 | 58.7 | |
| R10 | 93.1 | |
| R11 | 91.8 | |
| R12 | 81.0 | |
| R13 | 94.5 | |
| R14 | 99.6 | |



Spectral Distribution of Radiant Flux



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PREPARED FOR: PROGRESS

CATALOG NUMBER: P350209-031-30

LUMINAIRE: Acrylic Cylinder Flush Mount Ceiling

LAMP CAT. NO.: BXEN-30G-13H-9B

LAMP: 32- Bridgelux 3000K LEDs

BALLAST CATALOG NUMBER: JT-03-600-24-40

BALLAST: 1- Jintop - Programmed to 600mA

MOUNTING: Ceiling

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED.



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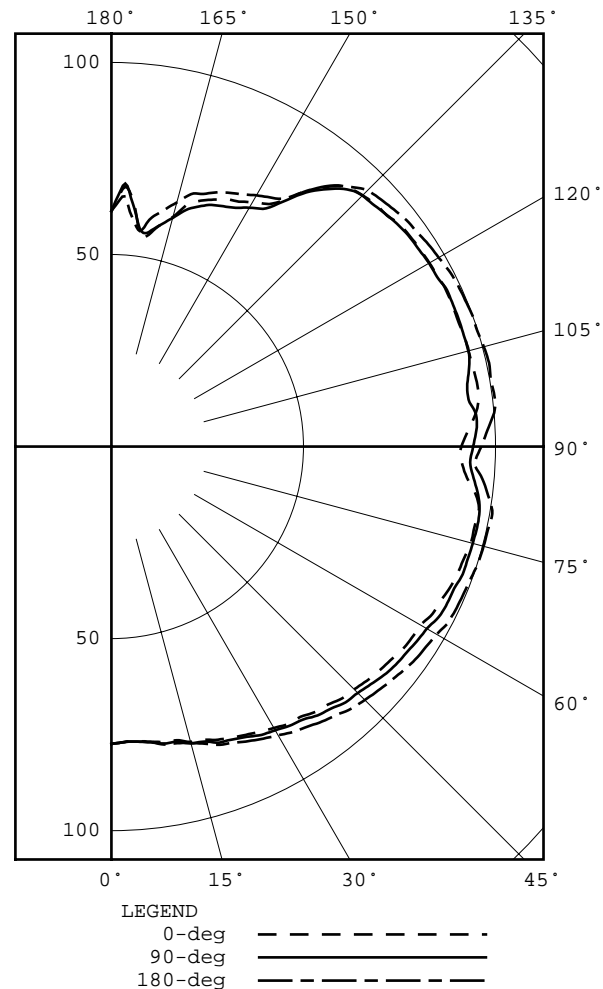
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| CANDELA DISTRIBUTION | | | | | | FLUX |
|----------------------|-----|------|------|-------|-------|------|
| | 0.0 | 45.0 | 90.0 | 135.0 | 180.0 | |
| 0 | 77 | 77 | 77 | 77 | 77 | |
| 5 | 77 | 79 | 77 | 78 | 77 | 7 |
| 15 | 80 | 81 | 80 | 81 | 80 | 23 |
| 25 | 83 | 83 | 83 | 85 | 85 | 39 |
| 35 | 86 | 85 | 87 | 87 | 89 | 55 |
| 45 | 89 | 87 | 91 | 91 | 93 | 70 |
| 55 | 92 | 88 | 94 | 93 | 97 | 83 |
| 65 | 95 | 89 | 97 | 95 | 99 | 93 |
| 75 | 97 | 89 | 97 | 97 | 100 | 101 |
| 85 | 93 | 93 | 95 | 95 | 97 | 104 |
| 90 | 91 | 92 | 94 | 92 | 96 | |
| 95 | 95 | 95 | 95 | 91 | 100 | 103 |
| 105 | 96 | 90 | 96 | 89 | 100 | 99 |
| 115 | 96 | 88 | 96 | 90 | 100 | 92 |
| 125 | 95 | 89 | 95 | 90 | 97 | 82 |
| 135 | 93 | 87 | 92 | 88 | 94 | 69 |
| 145 | 78 | 75 | 78 | 77 | 79 | 50 |
| 155 | 71 | 70 | 69 | 70 | 73 | 32 |
| 165 | 62 | 49 | 62 | 50 | 66 | 17 |
| 175 | 65 | 60 | 64 | 61 | 60 | 6 |
| 180 | 61 | 61 | 61 | 61 | 61 | |

| ZONAL ZONE | LUMEN LUMENS | SUMMARY %FIXT |
|------------|--------------|---------------|
| 0- 30 | 69 | 6.2 |
| 0- 40 | 124 | 11.0 |
| 0- 60 | 276 | 24.6 |
| 0- 90 | 574 | 51.1 |
| 90-120 | 294 | 26.1 |
| 90-130 | 376 | 33.5 |
| 90-150 | 495 | 44.1 |
| 90-180 | 549 | 48.9 |
| 0-180 | 1123 | 100.0 |

EFFICACY = 46.6 lm/W
CIE TYPE - GENERAL DIFFUSE
PLANE : 0-DEG 90-DEG 180-DEG
SPACING CRITERIA : 1.71 1.73 1.77
SHIELDING ANGLES : 90 90





®

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LUMINOUS DIAMETER: 16.000
HEIGHT OF SIDE : 1.150

| LUMINANCE DATA IN CANDELA/SQ M | | | |
|--------------------------------|------------------|-------------------|--------------------|
| ANGLE IN DEG | AVERAGE 0-DEG | AVERAGE 90-DEG | AVERAGE 180-DEG |
| 45 | 893. | 906. | 932. |
| 55 | 1098. | 1114. | 1148. |
| 65 | 1444. | 1471. | 1513. |
| 75 | 2151. | 2163. | 2227. |
| 85 | 4016. | 4094. | 4193. |



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CANDELA DISTRIBUTION
LATERAL ANGLE

| | 0.0 | 5.0 | 10.0 | 15.0 | 20.0 | 22.5 | 25.0 | 30.0 | 35.0 | 40.0 | 45.0 | 50.0 | 55.0 | 60.0 |
|-------|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|
| 0.0 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 |
| 2.5 | 77 | 77 | 77 | 77 | 77 | 77 | 78 | 78 | 78 | 79 | 78 | 78 | 79 | 78 |
| 5.0 | 77 | 77 | 77 | 77 | 77 | 78 | 78 | 78 | 79 | 78 | 79 | 79 | 79 | 78 |
| 7.5 | 78 | 78 | 78 | 78 | 78 | 78 | 78 | 78 | 79 | 79 | 79 | 79 | 79 | 79 |
| 10.0 | 78 | 78 | 79 | 78 | 79 | 79 | 79 | 79 | 79 | 80 | 80 | 80 | 80 | 80 |
| 12.5 | 78 | 79 | 78 | 78 | 79 | 79 | 79 | 79 | 80 | 80 | 80 | 80 | 80 | 80 |
| 15.0 | 80 | 79 | 80 | 80 | 80 | 80 | 80 | 80 | 81 | 81 | 81 | 81 | 81 | 81 |
| 17.5 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 81 | 81 | 81 | 81 | 81 | 81 | 81 |
| 20.0 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 82 | 82 | 82 | 82 | 82 | 82 |
| 22.5 | 82 | 82 | 82 | 82 | 82 | 82 | 82 | 82 | 83 | 82 | 82 | 83 | 83 | 83 |
| 25.0 | 83 | 83 | 83 | 83 | 83 | 83 | 83 | 83 | 83 | 83 | 83 | 83 | 84 | 83 |
| 27.5 | 84 | 84 | 84 | 84 | 84 | 84 | 83 | 84 | 84 | 84 | 84 | 84 | 84 | 84 |
| 30.0 | 85 | 85 | 85 | 85 | 84 | 85 | 84 | 85 | 85 | 85 | 84 | 85 | 85 | 85 |
| 32.5 | 86 | 86 | 86 | 86 | 85 | 85 | 85 | 85 | 85 | 85 | 85 | 85 | 86 | 85 |
| 35.0 | 86 | 86 | 86 | 86 | 85 | 85 | 85 | 85 | 86 | 86 | 85 | 85 | 86 | 85 |
| 37.5 | 87 | 87 | 87 | 87 | 87 | 86 | 86 | 86 | 87 | 86 | 86 | 86 | 87 | 86 |
| 40.0 | 88 | 88 | 88 | 88 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 |
| 42.5 | 89 | 89 | 89 | 88 | 88 | 88 | 88 | 87 | 88 | 87 | 87 | 87 | 87 | 87 |
| 45.0 | 89 | 90 | 89 | 89 | 89 | 88 | 88 | 88 | 88 | 88 | 87 | 87 | 87 | 88 |
| 47.5 | 90 | 90 | 90 | 89 | 89 | 89 | 88 | 88 | 88 | 88 | 87 | 87 | 88 | 87 |
| 50.0 | 91 | 91 | 91 | 90 | 90 | 90 | 90 | 89 | 88 | 88 | 88 | 88 | 88 | 88 |
| 52.5 | 92 | 92 | 91 | 91 | 90 | 90 | 90 | 89 | 88 | 88 | 88 | 88 | 87 | 88 |
| 55.0 | 92 | 92 | 92 | 91 | 91 | 90 | 90 | 89 | 89 | 88 | 88 | 88 | 87 | 88 |
| 57.5 | 93 | 93 | 92 | 92 | 91 | 91 | 90 | 89 | 89 | 88 | 88 | 87 | 87 | 88 |
| 60.0 | 93 | 93 | 93 | 92 | 92 | 91 | 91 | 90 | 89 | 88 | 88 | 88 | 87 | 88 |
| 62.5 | 94 | 94 | 94 | 93 | 92 | 92 | 92 | 91 | 89 | 89 | 88 | 88 | 88 | 89 |
| 65.0 | 95 | 95 | 94 | 94 | 93 | 93 | 92 | 91 | 89 | 89 | 89 | 88 | 88 | 89 |
| 67.5 | 96 | 95 | 95 | 94 | 93 | 93 | 93 | 91 | 90 | 89 | 89 | 88 | 88 | 89 |
| 70.0 | 96 | 96 | 96 | 95 | 94 | 94 | 93 | 92 | 90 | 89 | 89 | 88 | 88 | 90 |
| 72.5 | 96 | 96 | 96 | 96 | 95 | 94 | 94 | 92 | 90 | 89 | 89 | 88 | 88 | 90 |
| 75.0 | 97 | 97 | 96 | 96 | 95 | 95 | 94 | 93 | 91 | 89 | 89 | 89 | 89 | 91 |
| 77.5 | 97 | 97 | 96 | 96 | 95 | 95 | 95 | 93 | 91 | 90 | 90 | 89 | 90 | 92 |
| 80.0 | 97 | 97 | 97 | 97 | 96 | 96 | 95 | 94 | 92 | 91 | 91 | 91 | 91 | 93 |
| 82.5 | 96 | 96 | 96 | 96 | 96 | 96 | 95 | 94 | 93 | 92 | 92 | 92 | 92 | 93 |
| 85.0 | 93 | 93 | 93 | 94 | 94 | 94 | 94 | 94 | 94 | 93 | 93 | 93 | 93 | 93 |
| 87.5 | 91 | 91 | 91 | 91 | 92 | 93 | 93 | 95 | 94 | 93 | 92 | 92 | 93 | 93 |
| 90.0 | 91 | 91 | 90 | 91 | 91 | 92 | 93 | 94 | 95 | 94 | 92 | 92 | 94 | 93 |
| 92.5 | 93 | 93 | 91 | 91 | 91 | 91 | 92 | 94 | 95 | 94 | 93 | 94 | 94 | 93 |
| 95.0 | 95 | 95 | 94 | 93 | 92 | 92 | 92 | 94 | 96 | 95 | 95 | 95 | 95 | 93 |
| 97.5 | 96 | 96 | 95 | 95 | 93 | 93 | 92 | 94 | 95 | 95 | 94 | 94 | 94 | 93 |
| 100.0 | 97 | 96 | 96 | 95 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 92 |
| 102.5 | 96 | 96 | 95 | 94 | 93 | 93 | 92 | 92 | 92 | 92 | 92 | 91 | 91 | 91 |
| 105.0 | 96 | 96 | 95 | 94 | 92 | 92 | 92 | 92 | 91 | 90 | 90 | 89 | 89 | 91 |
| 107.5 | 96 | 96 | 95 | 93 | 92 | 92 | 92 | 91 | 90 | 89 | 88 | 88 | 88 | 90 |
| 110.0 | 96 | 96 | 94 | 93 | 92 | 92 | 91 | 91 | 89 | 88 | 87 | 87 | 88 | 90 |
| 112.5 | 96 | 96 | 94 | 93 | 92 | 92 | 91 | 90 | 89 | 88 | 88 | 87 | 87 | 90 |
| 115.0 | 96 | 96 | 94 | 93 | 92 | 92 | 91 | 90 | 89 | 88 | 88 | 87 | 87 | 89 |
| 117.5 | 96 | 95 | 94 | 93 | 92 | 91 | 91 | 89 | 88 | 88 | 88 | 87 | 87 | 89 |
| 120.0 | 96 | 95 | 94 | 93 | 92 | 92 | 91 | 89 | 88 | 88 | 88 | 87 | 87 | 88 |
| 122.5 | 95 | 95 | 94 | 93 | 92 | 91 | 91 | 89 | 88 | 88 | 88 | 88 | 87 | 87 |
| 125.0 | 95 | 95 | 94 | 93 | 92 | 92 | 91 | 89 | 88 | 88 | 89 | 89 | 87 | 87 |
| 127.5 | 95 | 94 | 94 | 93 | 92 | 91 | 91 | 88 | 87 | 89 | 89 | 89 | 87 | 87 |
| 130.0 | 94 | 94 | 93 | 93 | 92 | 91 | 90 | 88 | 87 | 89 | 89 | 89 | 87 | 86 |
| 132.5 | 93 | 93 | 93 | 93 | 92 | 91 | 90 | 87 | 87 | 89 | 89 | 89 | 86 | 86 |
| 135.0 | 93 | 93 | 92 | 92 | 91 | 90 | 89 | 86 | 86 | 87 | 87 | 87 | 86 | 85 |
| 137.5 | 91 | 91 | 90 | 90 | 89 | 88 | 87 | 85 | 85 | 84 | 84 | 85 | 85 | 84 |
| 140.0 | 88 | 88 | 89 | 88 | 87 | 86 | 85 | 84 | 84 | 82 | 82 | 82 | 84 | 83 |
| 142.5 | 84 | 84 | 84 | 85 | 84 | 84 | 83 | 83 | 80 | 77 | 77 | 78 | 81 | 82 |
| 145.0 | 78 | 79 | 79 | 80 | 81 | 82 | 82 | 82 | 78 | 75 | 75 | 76 | 79 | 81 |
| 147.5 | 75 | 75 | 76 | 77 | 78 | 79 | 79 | 79 | 76 | 74 | 74 | 74 | 77 | 80 |

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| | CANDELA DISTRIBUTION | | | | | | | | | | | | | |
|-------|----------------------|-----|------|------|------|------|------|------|------|------|------|------|------|------|
| | LATERAL ANGLE | | | | | | | | | | | | | |
| | 0.0 | 5.0 | 10.0 | 15.0 | 20.0 | 22.5 | 25.0 | 30.0 | 35.0 | 40.0 | 45.0 | 50.0 | 55.0 | 60.0 |
| 150.0 | 74 | 74 | 74 | 73 | 74 | 75 | 76 | 74 | 73 | 73 | 73 | 73 | 75 | 77 |
| 152.5 | 72 | 72 | 72 | 72 | 72 | 71 | 70 | 68 | 69 | 71 | 71 | 71 | 71 | 71 |
| 155.0 | 71 | 71 | 71 | 71 | 69 | 68 | 67 | 64 | 64 | 66 | 70 | 68 | 65 | 64 |
| 157.5 | 70 | 70 | 69 | 68 | 67 | 66 | 65 | 62 | 61 | 61 | 61 | 61 | 60 | 61 |
| 160.0 | 68 | 68 | 67 | 66 | 64 | 64 | 63 | 61 | 60 | 56 | 50 | 52 | 57 | 60 |
| 162.5 | 66 | 66 | 65 | 64 | 62 | 61 | 61 | 60 | 56 | 50 | 48 | 49 | 53 | 59 |
| 165.0 | 62 | 63 | 62 | 62 | 61 | 61 | 61 | 57 | 51 | 49 | 49 | 50 | 50 | 54 |
| 167.5 | 59 | 59 | 60 | 61 | 61 | 60 | 59 | 53 | 51 | 51 | 51 | 51 | 51 | 52 |
| 170.0 | 56 | 57 | 60 | 63 | 61 | 58 | 56 | 55 | 54 | 54 | 54 | 54 | 54 | 55 |
| 172.5 | 56 | 58 | 61 | 62 | 60 | 59 | 59 | 59 | 58 | 59 | 59 | 58 | 59 | 59 |
| 175.0 | 65 | 63 | 61 | 60 | 60 | 61 | 60 | 60 | 60 | 59 | 60 | 60 | 60 | 60 |
| 177.5 | 67 | 66 | 62 | 59 | 59 | 60 | 61 | 60 | 59 | 59 | 59 | 60 | 60 | 60 |
| 180.0 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 |



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CANDELA DISTRIBUTION
LATERAL ANGLE

| | 65.0 | 67.5 | 70.0 | 75.0 | 80.0 | 85.0 | 90.0 | 95.0 | 100.0 | 105.0 | 110.0 | 112.5 | 115.0 | 120.0 |
|-------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|
| 0.0 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 |
| 2.5 | 78 | 78 | 78 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 78 | 78 | 78 | 78 |
| 5.0 | 78 | 78 | 78 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 78 | 78 | 78 |
| 7.5 | 79 | 78 | 78 | 78 | 78 | 78 | 78 | 78 | 78 | 78 | 78 | 78 | 79 | 79 |
| 10.0 | 79 | 79 | 79 | 79 | 79 | 79 | 79 | 79 | 79 | 79 | 79 | 79 | 79 | 80 |
| 12.5 | 79 | 79 | 79 | 79 | 79 | 79 | 79 | 79 | 79 | 79 | 79 | 79 | 79 | 80 |
| 15.0 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 81 |
| 17.5 | 81 | 81 | 81 | 80 | 80 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 82 |
| 20.0 | 82 | 82 | 82 | 82 | 82 | 82 | 82 | 82 | 82 | 82 | 82 | 82 | 82 | 83 |
| 22.5 | 82 | 82 | 82 | 82 | 82 | 83 | 83 | 83 | 82 | 83 | 83 | 83 | 83 | 84 |
| 25.0 | 83 | 83 | 83 | 83 | 83 | 83 | 83 | 83 | 84 | 84 | 84 | 84 | 84 | 85 |
| 27.5 | 84 | 84 | 84 | 84 | 84 | 84 | 85 | 85 | 85 | 85 | 85 | 85 | 85 | 86 |
| 30.0 | 85 | 85 | 85 | 85 | 85 | 85 | 85 | 85 | 86 | 86 | 86 | 86 | 86 | 87 |
| 32.5 | 85 | 86 | 85 | 86 | 86 | 86 | 86 | 87 | 87 | 87 | 87 | 87 | 87 | 88 |
| 35.0 | 86 | 86 | 86 | 86 | 86 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 88 | 88 |
| 37.5 | 87 | 87 | 87 | 87 | 88 | 88 | 88 | 89 | 89 | 89 | 89 | 89 | 89 | 89 |
| 40.0 | 87 | 88 | 88 | 88 | 89 | 89 | 89 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| 42.5 | 88 | 88 | 88 | 89 | 90 | 90 | 90 | 90 | 90 | 91 | 91 | 91 | 91 | 91 |
| 45.0 | 88 | 89 | 89 | 89 | 90 | 91 | 91 | 91 | 91 | 92 | 92 | 91 | 91 | 91 |
| 47.5 | 88 | 89 | 89 | 90 | 90 | 91 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| 50.0 | 89 | 89 | 90 | 91 | 92 | 92 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 92 |
| 52.5 | 89 | 90 | 90 | 91 | 92 | 93 | 93 | 94 | 94 | 94 | 93 | 93 | 93 | 93 |
| 55.0 | 90 | 90 | 91 | 92 | 92 | 93 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 93 |
| 57.5 | 90 | 90 | 91 | 92 | 93 | 94 | 94 | 94 | 95 | 95 | 94 | 94 | 94 | 93 |
| 60.0 | 90 | 91 | 91 | 92 | 93 | 94 | 95 | 95 | 95 | 95 | 95 | 95 | 94 | 94 |
| 62.5 | 91 | 92 | 92 | 93 | 94 | 95 | 96 | 97 | 96 | 96 | 96 | 95 | 95 | 95 |
| 65.0 | 91 | 92 | 92 | 94 | 95 | 95 | 97 | 97 | 97 | 96 | 96 | 96 | 96 | 95 |
| 67.5 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 97 | 97 | 97 | 97 | 96 | 96 | 95 |
| 70.0 | 92 | 93 | 94 | 95 | 96 | 96 | 97 | 98 | 98 | 98 | 98 | 97 | 97 | 96 |
| 72.5 | 92 | 93 | 94 | 95 | 96 | 96 | 97 | 98 | 98 | 98 | 98 | 97 | 97 | 96 |
| 75.0 | 93 | 93 | 94 | 95 | 96 | 97 | 97 | 98 | 98 | 98 | 98 | 98 | 97 | 96 |
| 77.5 | 93 | 94 | 94 | 95 | 96 | 97 | 98 | 98 | 98 | 98 | 98 | 98 | 97 | 96 |
| 80.0 | 93 | 93 | 94 | 95 | 96 | 97 | 97 | 98 | 98 | 98 | 97 | 97 | 97 | 96 |
| 82.5 | 93 | 93 | 94 | 95 | 96 | 97 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 |
| 85.0 | 93 | 93 | 93 | 94 | 95 | 95 | 95 | 94 | 93 | 94 | 95 | 95 | 96 | 96 |
| 87.5 | 93 | 93 | 93 | 94 | 94 | 94 | 94 | 92 | 92 | 93 | 94 | 95 | 96 | 97 |
| 90.0 | 92 | 92 | 92 | 93 | 93 | 94 | 94 | 95 | 94 | 95 | 95 | 96 | 96 | 97 |
| 92.5 | 91 | 91 | 91 | 91 | 91 | 93 | 95 | 96 | 96 | 96 | 96 | 96 | 96 | 96 |
| 95.0 | 91 | 90 | 89 | 90 | 91 | 93 | 95 | 97 | 97 | 96 | 96 | 95 | 95 | 95 |
| 97.5 | 91 | 90 | 89 | 90 | 90 | 92 | 94 | 95 | 96 | 96 | 95 | 95 | 94 | 94 |
| 100.0 | 92 | 91 | 90 | 90 | 91 | 92 | 94 | 95 | 95 | 95 | 94 | 94 | 94 | 94 |
| 102.5 | 92 | 92 | 92 | 92 | 93 | 94 | 95 | 96 | 95 | 95 | 94 | 94 | 94 | 93 |
| 105.0 | 91 | 91 | 92 | 93 | 94 | 95 | 96 | 96 | 95 | 94 | 94 | 94 | 93 | 93 |
| 107.5 | 91 | 91 | 92 | 93 | 94 | 95 | 96 | 96 | 95 | 94 | 93 | 93 | 93 | 92 |
| 110.0 | 91 | 91 | 92 | 93 | 94 | 95 | 96 | 95 | 94 | 93 | 92 | 92 | 92 | 92 |
| 112.5 | 92 | 92 | 92 | 93 | 94 | 95 | 96 | 95 | 94 | 93 | 92 | 92 | 92 | 91 |
| 115.0 | 91 | 92 | 92 | 93 | 94 | 95 | 96 | 95 | 94 | 93 | 93 | 92 | 92 | 91 |
| 117.5 | 91 | 92 | 92 | 93 | 94 | 95 | 96 | 95 | 93 | 93 | 92 | 92 | 92 | 91 |
| 120.0 | 91 | 92 | 92 | 93 | 94 | 95 | 96 | 95 | 93 | 93 | 92 | 92 | 91 | 91 |
| 122.5 | 90 | 91 | 92 | 93 | 94 | 95 | 95 | 94 | 93 | 93 | 92 | 92 | 91 | 90 |
| 125.0 | 90 | 91 | 92 | 93 | 94 | 95 | 95 | 94 | 94 | 93 | 93 | 92 | 91 | 90 |
| 127.5 | 89 | 91 | 92 | 93 | 94 | 94 | 94 | 94 | 93 | 93 | 92 | 92 | 91 | 89 |
| 130.0 | 88 | 90 | 91 | 92 | 93 | 93 | 94 | 94 | 93 | 93 | 92 | 91 | 91 | 89 |
| 132.5 | 88 | 89 | 91 | 92 | 92 | 93 | 93 | 93 | 93 | 92 | 92 | 91 | 91 | 89 |
| 135.0 | 86 | 88 | 89 | 90 | 92 | 92 | 92 | 93 | 93 | 92 | 92 | 91 | 91 | 88 |
| 137.5 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 91 | 91 | 90 | 90 | 89 | 87 |
| 140.0 | 84 | 85 | 85 | 86 | 87 | 88 | 88 | 88 | 89 | 89 | 88 | 88 | 88 | 86 |
| 142.5 | 83 | 82 | 83 | 83 | 83 | 83 | 83 | 84 | 84 | 85 | 85 | 85 | 85 | 83 |
| 145.0 | 82 | 81 | 81 | 80 | 79 | 78 | 78 | 78 | 78 | 79 | 81 | 81 | 82 | 81 |
| 147.5 | 80 | 79 | 78 | 77 | 75 | 74 | 73 | 73 | 73 | 74 | 76 | 77 | 78 | 77 |

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LATERAL ANGLE

| | 65.0 | 67.5 | 70.0 | 75.0 | 80.0 | 85.0 | 90.0 | 95.0 | 100.0 | 105.0 | 110.0 | 112.5 | 115.0 | 120.0 |
|-------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|
| 150.0 | 77 | 75 | 74 | 72 | 72 | 72 | 72 | 72 | 72 | 71 | 72 | 72 | 72 | 72 |
| 152.5 | 71 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 69 | 68 | 67 | 66 |
| 155.0 | 66 | 68 | 69 | 69 | 69 | 69 | 69 | 69 | 69 | 68 | 67 | 66 | 65 | 63 |
| 157.5 | 64 | 65 | 66 | 67 | 67 | 68 | 68 | 68 | 67 | 66 | 65 | 64 | 63 | 61 |
| 160.0 | 62 | 63 | 64 | 65 | 66 | 66 | 67 | 66 | 65 | 64 | 63 | 62 | 61 | 60 |
| 162.5 | 61 | 62 | 63 | 63 | 64 | 65 | 65 | 64 | 62 | 61 | 60 | 60 | 60 | 59 |
| 165.0 | 59 | 60 | 61 | 61 | 62 | 62 | 62 | 61 | 60 | 60 | 59 | 59 | 60 | 56 |
| 167.5 | 56 | 58 | 60 | 60 | 60 | 60 | 59 | 59 | 59 | 59 | 60 | 59 | 58 | 53 |
| 170.0 | 55 | 56 | 59 | 60 | 59 | 57 | 57 | 58 | 60 | 61 | 60 | 59 | 56 | 54 |
| 172.5 | 59 | 58 | 58 | 59 | 59 | 57 | 57 | 60 | 63 | 63 | 61 | 59 | 59 | 58 |
| 175.0 | 60 | 59 | 58 | 56 | 57 | 61 | 64 | 65 | 65 | 64 | 63 | 62 | 61 | 61 |
| 177.5 | 59 | 58 | 57 | 58 | 62 | 65 | 68 | 68 | 65 | 63 | 63 | 63 | 62 | 61 |
| 180.0 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 |



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CANDELA DISTRIBUTION
LATERAL ANGLE

| | 125.0 | 130.0 | 135.0 | 140.0 | 145.0 | 150.0 | 155.0 | 157.5 | 160.0 | 165.0 | 170.0 | 175.0 | 180.0 |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0.0 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 |
| 2.5 | 79 | 78 | 79 | 78 | 79 | 78 | 78 | 78 | 77 | 77 | 77 | 77 | 77 |
| 5.0 | 79 | 79 | 78 | 79 | 78 | 78 | 78 | 78 | 78 | 77 | 77 | 77 | 77 |
| 7.5 | 79 | 79 | 79 | 79 | 79 | 79 | 79 | 78 | 78 | 78 | 78 | 78 | 78 |
| 10.0 | 80 | 80 | 80 | 80 | 80 | 80 | 79 | 79 | 79 | 79 | 79 | 79 | 79 |
| 12.5 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 79 | 79 | 79 | 79 | 79 |
| 15.0 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 81 | 80 | 81 | 81 | 81 | 80 |
| 17.5 | 82 | 82 | 82 | 82 | 82 | 82 | 81 | 82 | 81 | 81 | 81 | 81 | 81 |
| 20.0 | 83 | 83 | 83 | 83 | 83 | 83 | 83 | 83 | 83 | 83 | 83 | 83 | 83 |
| 22.5 | 84 | 84 | 83 | 83 | 84 | 84 | 84 | 83 | 84 | 83 | 84 | 83 | 83 |
| 25.0 | 85 | 85 | 85 | 85 | 85 | 85 | 85 | 85 | 84 | 85 | 84 | 84 | 85 |
| 27.5 | 86 | 85 | 85 | 85 | 86 | 86 | 86 | 86 | 86 | 86 | 86 | 86 | 86 |
| 30.0 | 87 | 86 | 86 | 86 | 87 | 87 | 87 | 86 | 87 | 87 | 87 | 87 | 87 |
| 32.5 | 88 | 87 | 87 | 87 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 |
| 35.0 | 88 | 88 | 87 | 87 | 88 | 88 | 88 | 88 | 88 | 88 | 89 | 89 | 89 |
| 37.5 | 89 | 89 | 89 | 89 | 89 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| 40.0 | 90 | 90 | 89 | 90 | 90 | 90 | 90 | 90 | 90 | 91 | 91 | 91 | 91 |
| 42.5 | 91 | 90 | 90 | 90 | 91 | 91 | 91 | 91 | 92 | 92 | 92 | 92 | 93 |
| 45.0 | 91 | 91 | 91 | 91 | 91 | 92 | 92 | 92 | 92 | 92 | 93 | 93 | 93 |
| 47.5 | 91 | 91 | 91 | 91 | 92 | 92 | 92 | 93 | 93 | 93 | 94 | 94 | 94 |
| 50.0 | 92 | 92 | 92 | 92 | 92 | 93 | 93 | 94 | 94 | 94 | 95 | 95 | 95 |
| 52.5 | 92 | 92 | 92 | 92 | 93 | 93 | 94 | 94 | 94 | 95 | 96 | 96 | 96 |
| 55.0 | 93 | 93 | 93 | 93 | 93 | 93 | 94 | 95 | 95 | 96 | 96 | 96 | 97 |
| 57.5 | 93 | 93 | 93 | 93 | 93 | 93 | 94 | 95 | 95 | 96 | 97 | 97 | 97 |
| 60.0 | 93 | 93 | 93 | 94 | 93 | 94 | 95 | 96 | 96 | 97 | 97 | 98 | 98 |
| 62.5 | 94 | 94 | 95 | 94 | 94 | 95 | 96 | 96 | 97 | 98 | 99 | 99 | 99 |
| 65.0 | 94 | 94 | 95 | 95 | 94 | 95 | 96 | 97 | 97 | 98 | 99 | 99 | 99 |
| 67.5 | 94 | 95 | 95 | 95 | 94 | 95 | 96 | 97 | 97 | 99 | 99 | 99 | 99 |
| 70.0 | 95 | 95 | 96 | 96 | 95 | 96 | 97 | 98 | 98 | 99 | 100 | 100 | 100 |
| 72.5 | 95 | 96 | 97 | 96 | 95 | 96 | 98 | 98 | 99 | 99 | 100 | 100 | 100 |
| 75.0 | 95 | 96 | 97 | 97 | 96 | 97 | 98 | 99 | 99 | 99 | 100 | 100 | 100 |
| 77.5 | 95 | 96 | 97 | 97 | 96 | 97 | 98 | 98 | 99 | 99 | 100 | 101 | 100 |
| 80.0 | 96 | 96 | 98 | 98 | 97 | 98 | 98 | 98 | 99 | 99 | 100 | 101 | 101 |
| 82.5 | 96 | 96 | 97 | 98 | 98 | 98 | 98 | 98 | 98 | 99 | 99 | 99 | 99 |
| 85.0 | 96 | 95 | 95 | 97 | 99 | 99 | 98 | 98 | 97 | 97 | 97 | 97 | 97 |
| 87.5 | 96 | 93 | 93 | 95 | 100 | 100 | 98 | 97 | 96 | 96 | 95 | 95 | 95 |
| 90.0 | 95 | 92 | 92 | 94 | 100 | 100 | 99 | 98 | 97 | 96 | 95 | 96 | 96 |
| 92.5 | 94 | 92 | 91 | 94 | 99 | 99 | 98 | 97 | 96 | 96 | 96 | 97 | 98 |
| 95.0 | 94 | 91 | 91 | 94 | 98 | 99 | 98 | 98 | 97 | 98 | 98 | 99 | 100 |
| 97.5 | 92 | 90 | 91 | 94 | 97 | 99 | 98 | 98 | 98 | 98 | 99 | 100 | 101 |
| 100.0 | 91 | 89 | 90 | 92 | 95 | 98 | 98 | 98 | 98 | 98 | 99 | 100 | 100 |
| 102.5 | 91 | 89 | 89 | 91 | 94 | 97 | 98 | 98 | 98 | 98 | 99 | 100 | 101 |
| 105.0 | 90 | 89 | 89 | 91 | 94 | 97 | 98 | 98 | 98 | 98 | 99 | 99 | 100 |
| 107.5 | 90 | 89 | 89 | 90 | 92 | 96 | 97 | 98 | 98 | 98 | 99 | 99 | 100 |
| 110.0 | 90 | 89 | 89 | 89 | 92 | 95 | 97 | 97 | 98 | 98 | 99 | 99 | 100 |
| 112.5 | 90 | 89 | 89 | 89 | 92 | 95 | 97 | 97 | 98 | 99 | 99 | 100 | 100 |
| 115.0 | 90 | 90 | 90 | 90 | 91 | 94 | 97 | 97 | 98 | 98 | 99 | 99 | 100 |
| 117.5 | 90 | 89 | 90 | 90 | 90 | 93 | 96 | 97 | 97 | 98 | 99 | 99 | 99 |
| 120.0 | 89 | 89 | 90 | 89 | 90 | 93 | 96 | 96 | 97 | 98 | 98 | 99 | 98 |
| 122.5 | 89 | 89 | 91 | 90 | 90 | 92 | 95 | 96 | 97 | 97 | 98 | 98 | 98 |
| 125.0 | 89 | 89 | 90 | 90 | 90 | 93 | 95 | 96 | 96 | 97 | 97 | 97 | 97 |
| 127.5 | 88 | 89 | 90 | 90 | 90 | 92 | 95 | 95 | 96 | 96 | 97 | 97 | 97 |
| 130.0 | 88 | 88 | 90 | 90 | 89 | 92 | 94 | 95 | 95 | 95 | 96 | 96 | 96 |
| 132.5 | 87 | 87 | 90 | 89 | 88 | 91 | 94 | 94 | 94 | 95 | 95 | 95 | 95 |
| 135.0 | 86 | 86 | 88 | 88 | 88 | 90 | 92 | 92 | 92 | 93 | 94 | 94 | 94 |
| 137.5 | 85 | 84 | 85 | 87 | 87 | 88 | 90 | 90 | 90 | 91 | 92 | 92 | 92 |
| 140.0 | 82 | 81 | 82 | 84 | 86 | 87 | 88 | 88 | 88 | 88 | 89 | 89 | 89 |
| 142.5 | 79 | 78 | 79 | 81 | 84 | 85 | 86 | 85 | 85 | 85 | 84 | 84 | 84 |
| 145.0 | 77 | 77 | 77 | 78 | 81 | 84 | 84 | 83 | 83 | 82 | 80 | 80 | 79 |
| 147.5 | 76 | 75 | 75 | 75 | 78 | 81 | 81 | 80 | 79 | 78 | 77 | 77 | 77 |



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CANDELA DISTRIBUTION
LATERAL ANGLE

| | 125.0 | 130.0 | 135.0 | 140.0 | 145.0 | 150.0 | 155.0 | 157.5 | 160.0 | 165.0 | 170.0 | 175.0 | 180.0 |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 150.0 | 73 | 74 | 74 | 74 | 75 | 77 | 77 | 76 | 76 | 75 | 76 | 76 | 76 |
| 152.5 | 68 | 71 | 73 | 72 | 69 | 71 | 73 | 74 | 74 | 74 | 74 | 74 | 74 |
| 155.0 | 63 | 66 | 70 | 67 | 65 | 66 | 70 | 71 | 72 | 73 | 73 | 73 | 73 |
| 157.5 | 60 | 60 | 60 | 62 | 62 | 64 | 67 | 68 | 69 | 71 | 71 | 71 | 72 |
| 160.0 | 59 | 54 | 50 | 54 | 60 | 62 | 65 | 66 | 67 | 68 | 69 | 70 | 70 |
| 162.5 | 55 | 49 | 49 | 49 | 55 | 61 | 63 | 64 | 66 | 66 | 67 | 68 | 69 |
| 165.0 | 51 | 50 | 50 | 50 | 51 | 57 | 62 | 63 | 63 | 64 | 65 | 66 | 66 |
| 167.5 | 51 | 51 | 51 | 51 | 52 | 52 | 58 | 60 | 61 | 62 | 62 | 63 | 63 |
| 170.0 | 54 | 54 | 54 | 54 | 54 | 54 | 56 | 58 | 61 | 62 | 61 | 60 | 61 |
| 172.5 | 58 | 58 | 58 | 58 | 58 | 58 | 58 | 58 | 60 | 62 | 62 | 58 | 57 |
| 175.0 | 61 | 60 | 61 | 61 | 60 | 60 | 60 | 60 | 59 | 60 | 60 | 60 | 60 |
| 177.5 | 60 | 60 | 60 | 60 | 60 | 61 | 61 | 60 | 59 | 58 | 60 | 63 | 65 |
| 180.0 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 |



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5-DEGREE
ZONAL LUMEN SUMMARY

| | |
|---------|----|
| 0- 5 | 2 |
| 5- 10 | 6 |
| 10- 15 | 9 |
| 15- 20 | 13 |
| 20- 25 | 17 |
| 25- 30 | 21 |
| 30- 35 | 25 |
| 35- 40 | 29 |
| 40- 45 | 33 |
| 45- 50 | 37 |
| 50- 55 | 40 |
| 55- 60 | 43 |
| 60- 65 | 45 |
| 65- 70 | 48 |
| 70- 75 | 50 |
| 75- 80 | 51 |
| 80- 85 | 52 |
| 85- 90 | 52 |
| 90- 95 | 52 |
| 95-100 | 51 |
| 100-105 | 50 |
| 105-110 | 49 |
| 110-115 | 47 |
| 115-120 | 45 |
| 120-125 | 43 |
| 125-130 | 40 |
| 130-135 | 37 |
| 135-140 | 33 |
| 140-145 | 28 |
| 145-150 | 23 |
| 150-155 | 18 |
| 155-160 | 14 |
| 160-165 | 10 |
| 165-170 | 7 |
| 170-175 | 4 |
| 175-180 | 1 |

10-DEGREE
ZONAL LUMEN SUMMARY

| | |
|-------|------|
| 0- 10 | 7 |
| 0- 20 | 30 |
| 0- 30 | 69 |
| 0- 40 | 124 |
| 0- 50 | 194 |
| 0- 60 | 276 |
| 0- 70 | 369 |
| 0- 80 | 470 |
| 0- 90 | 574 |
| 0-100 | 677 |
| 0-110 | 776 |
| 0-120 | 868 |
| 0-130 | 950 |
| 0-140 | 1019 |
| 0-150 | 1069 |
| 0-160 | 1101 |
| 0-170 | 1118 |
| 0-180 | 1123 |



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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

EFFECTIVE FLOOR CAVITY REFLECTANCE 0.20

| RC | 80 | | | | 70 | | | | 50 | | | 30 | | | 10 | | | 0 | |
|----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | RW | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | | 10 |
| 0 | 107 | 107 | 107 | 107 | 107 | 99 | 99 | 99 | 99 | 84 | 84 | 84 | 70 | 70 | 70 | 57 | 57 | 57 | 51 |
| 1 | 93 | 87 | 82 | 76 | 76 | 86 | 80 | 75 | 71 | 67 | 63 | 59 | 55 | 52 | 49 | 43 | 41 | 39 | 34 |
| 2 | 83 | 74 | 66 | 59 | 59 | 76 | 68 | 61 | 55 | 56 | 51 | 46 | 45 | 41 | 38 | 36 | 33 | 30 | 25 |
| 3 | 75 | 63 | 54 | 47 | 47 | 68 | 58 | 50 | 44 | 48 | 42 | 37 | 39 | 34 | 30 | 30 | 27 | 24 | 19 |
| 4 | 68 | 55 | 46 | 39 | 39 | 62 | 51 | 42 | 36 | 42 | 35 | 30 | 34 | 29 | 25 | 26 | 22 | 19 | 15 |
| 5 | 62 | 49 | 39 | 32 | 32 | 56 | 45 | 36 | 30 | 37 | 30 | 25 | 30 | 25 | 21 | 23 | 19 | 16 | 13 |
| 6 | 57 | 43 | 34 | 28 | 28 | 52 | 40 | 32 | 26 | 33 | 26 | 21 | 27 | 22 | 18 | 21 | 17 | 14 | 11 |
| 7 | 52 | 39 | 30 | 24 | 24 | 48 | 36 | 28 | 22 | 30 | 23 | 19 | 24 | 19 | 15 | 19 | 15 | 12 | 9 |
| 8 | 49 | 35 | 27 | 21 | 21 | 44 | 32 | 25 | 19 | 27 | 21 | 16 | 22 | 17 | 13 | 17 | 13 | 10 | 8 |
| 9 | 45 | 32 | 24 | 18 | 18 | 41 | 29 | 22 | 17 | 25 | 18 | 14 | 20 | 15 | 12 | 16 | 12 | 9 | 7 |
| 10 | 42 | 29 | 21 | 16 | 16 | 38 | 27 | 20 | 15 | 23 | 17 | 13 | 18 | 14 | 10 | 15 | 11 | 8 | 6 |

ALL CANDELA, LUMENS, LUMINANCE, AND VCP VALUES IN THIS REPORT ARE BASED ON ABSOLUTE PHOTOMETRY. THE COEFFICIENT OF UTILIZATION VALUES ARE BASED ON THE TOTAL ABSOLUTE LUMEN OUTPUT OF THIS TEST SAMPLE.

Project Number
20.00776



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Date
6/25/2020

Goniophotometer Calibration

Calibration Lamp: GE 1000W, 120V, T6, CL (FEL)

Lamp Number: ITL78966-1000-66

Calibration Current: 8.300 Amps DC

Total Luminous Flux: 23013.0 Lumens

Calibration Date: 08/20/2019

Test Equipment Used

| <i>Instrument</i> | <i>Manufacturer / Model</i> | <i>S/N</i> | <i>Calibration Due:</i> |
|------------------------|--------------------------------------|------------|-------------------------|
| <i>Goniophotometer</i> | ITL/HLI LAB 5 - Test Distance: 56.0' | N/A | N/A |
| <i>Power Analyzer</i> | Yokogawa / WT 332 | C2QA27072V | 10/31/2020 |
| <i>Power Source</i> | Voltage-Regulated House Power | N/A | N/A |
| <i>Thermometer</i> | National Instruments / USB-TC01 | 1912722 | 10/31/2020 |

3-Meter-Sphere Calibration

Calibration Lamp: EIKO 28V75W/E10

Lamp Number: SCL-1400-K136

Calibration Current: 2.679 Amps

Total Luminous Flux: 1429 Lumens

Test Equipment Used - Color & SPD; THD & Power Factor

| <i>Instrument</i> | <i>Manufacturer / Model</i> | <i>S/N</i> | <i>Calibration Due:</i> |
|----------------------------|---------------------------------|--------------|---------------------------|
| <i>3-Meter Sphere</i> | Labsphere / LMS-3M | N/A | Calibration Checked Daily |
| <i>Thermometer</i> | National Instruments / USB TC01 | 1912751 | 10/31/2020 |
| <i>Power Analyzer</i> | Yokogawa / WT332 | C2QA27075V | 10/31/2020 |
| <i>Power Supply</i> | Chroma / 61602 | 616020002113 | N/A |
| <i>Power Supply PF/THD</i> | Voltage-Regulated House Power | N/A | N/A |
| <i>Aux Lamp Supply</i> | GW Instek / PSU 150-10 | GER221028 | N/A |
| <i>Cal Lamp Supply</i> | Labsphere / LPS-150-0268 | 1218148505 | N/A |
| <i>Spectrometer</i> | Labsphere / CDS 1100 | 0624117792 | N/A |

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This report shall not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.