

itl boulder
THE LIGHT CENTER OF THE INDUSTRY SINCE 1955

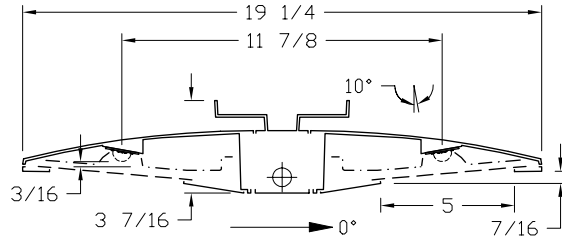
NVLAP
NVLAP LAB CODE: 200925-0

INDEPENDENT TESTING LABORATORIES, INC.
3386 LONGHORN ROAD, BOULDER, CO 80302 USA

PHONE: (303)442-1255 • FAX: (303)449-5274 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

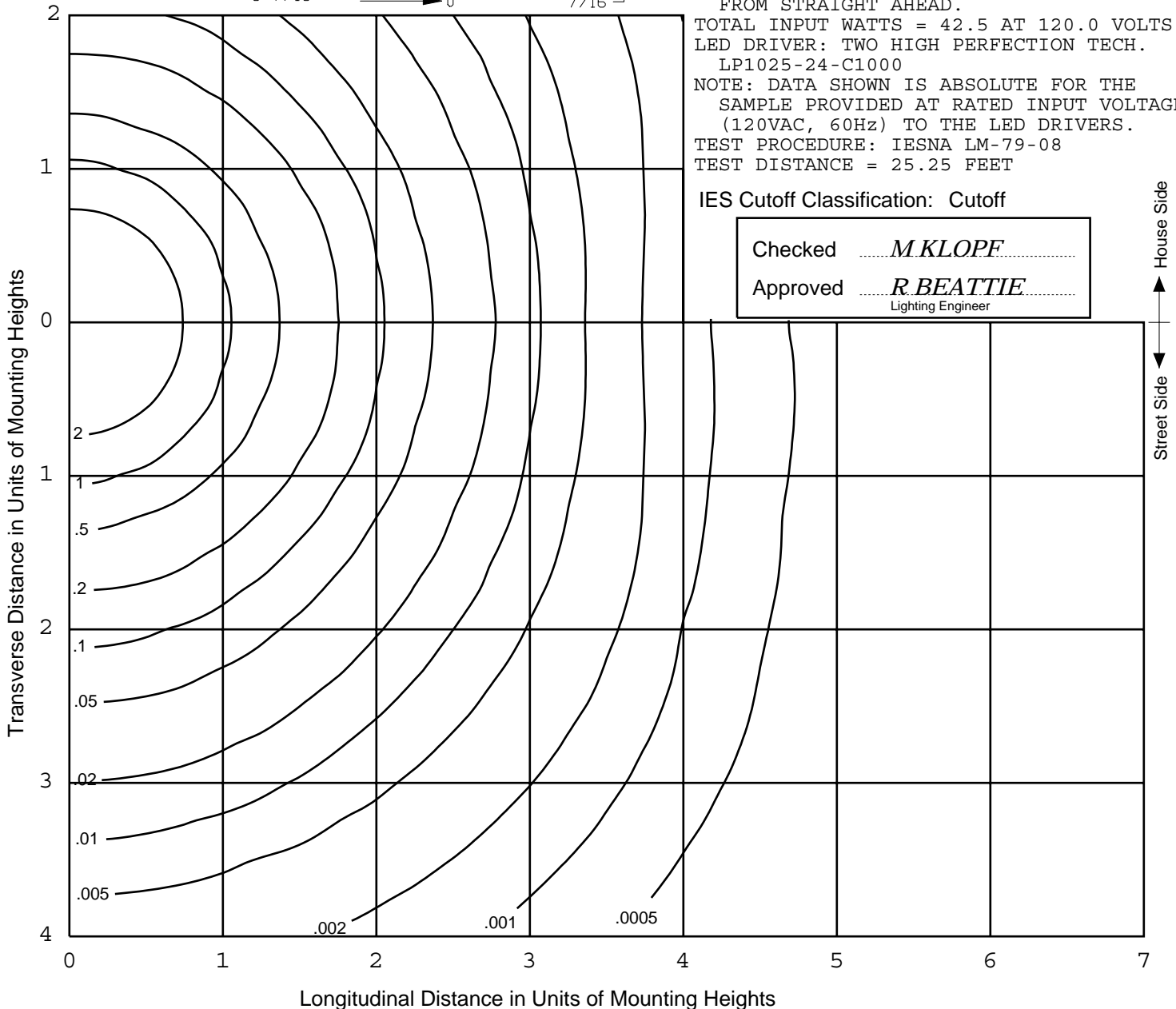
Values based on 15 foot mounting height.

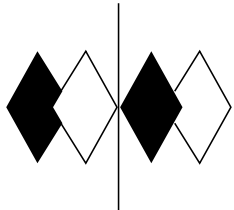


REPORT NUMBER: ITL69258
ISSUE DATE: 07/05/11 PAGE: 1 OF 6
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: CLED2X20 / PLED2X20
LUMINAIRE: ONE LUMINAIRE CONSISTING OF TWO OPPOSING LIGHT HEADS, EACH LIGHT HEAD CONSISTING OF: CAST FINNED METAL HOUSING, TWO CIRCUIT BOARDS EACH WITH ONE LED CHIP, FORMED SPECULAR METAL REFLECTOR, CLEAR FLAT GLASS LENS IN CAST BROWN PAINTED METAL LENS FRAME.
LAMPS: FOUR CHIPS EACH WITH A 3X3 ARRAY OF WHITE LIGHT EMITTING DIODES (LEDs) AND A CLEAR HEMISPHERICAL INTEGRAL LENS, TILTED 10-DEGREES FROM VERTICAL BASE UP POSITION AND CANTED 10-DEGREES FROM STRAIGHT AHEAD.
TOTAL INPUT WATTS = 42.5 AT 120.0 VOLTS
LED DRIVER: TWO HIGH PERFECTION TECH. LP1025-24-C1000
NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE (120VAC, 60Hz) TO THE LED DRIVERS.
TEST PROCEDURE: IESNA LM-79-08
TEST DISTANCE = 25.25 FEET

IES Cutoff Classification: Cutoff

Checked M.KLOPF
Approved R.BEATTIE
Lighting Engineer





itl boulder

THE LIGHT CENTER OF THE INDUSTRY SINCE 1955

NVLAP
NVLAP LAB CODE: 200925-0

INDEPENDENT TESTING LABORATORIES, INC.

3386 LONGHORN ROAD, BOULDER, CO 80302 USA

PHONE: (303)442-1255 • FAX: (303)449-5274 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

REPORT NUMBER: ITL69258

ISSUE DATE: 07/05/11 PAGE: 2 OF 6

PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: CLED2X20 / PLED2X20

LUMINAIRE: ONE LUMINAIRE CONSISTING OF TWO OPPOSING LIGHT HEADS, EACH LIGHT HEAD CONSISTING OF: CAST FINNED METAL HOUSING, TWO CIRCUIT BOARDS EACH WITH ONE LED CHIP, FORMED SPECULAR METAL REFLECTOR, CLEAR FLAT GLASS LENS IN CAST BROWN PAINTED METAL LENS FRAME.

LAMPS: FOUR CHIPS EACH WITH A 3X3 ARRAY OF WHITE LIGHT EMITTING DIODES (LEDs) AND A CLEAR HEMISPHERICAL INTEGRAL LENS, TILTED 10-DEGREES FROM VERTICAL BASE UP POSITION AND CANTED 10-DEGREES FROM STRAIGHT AHEAD.

TOTAL INPUT WATTS = 42.5 AT 120.0 VOLTS

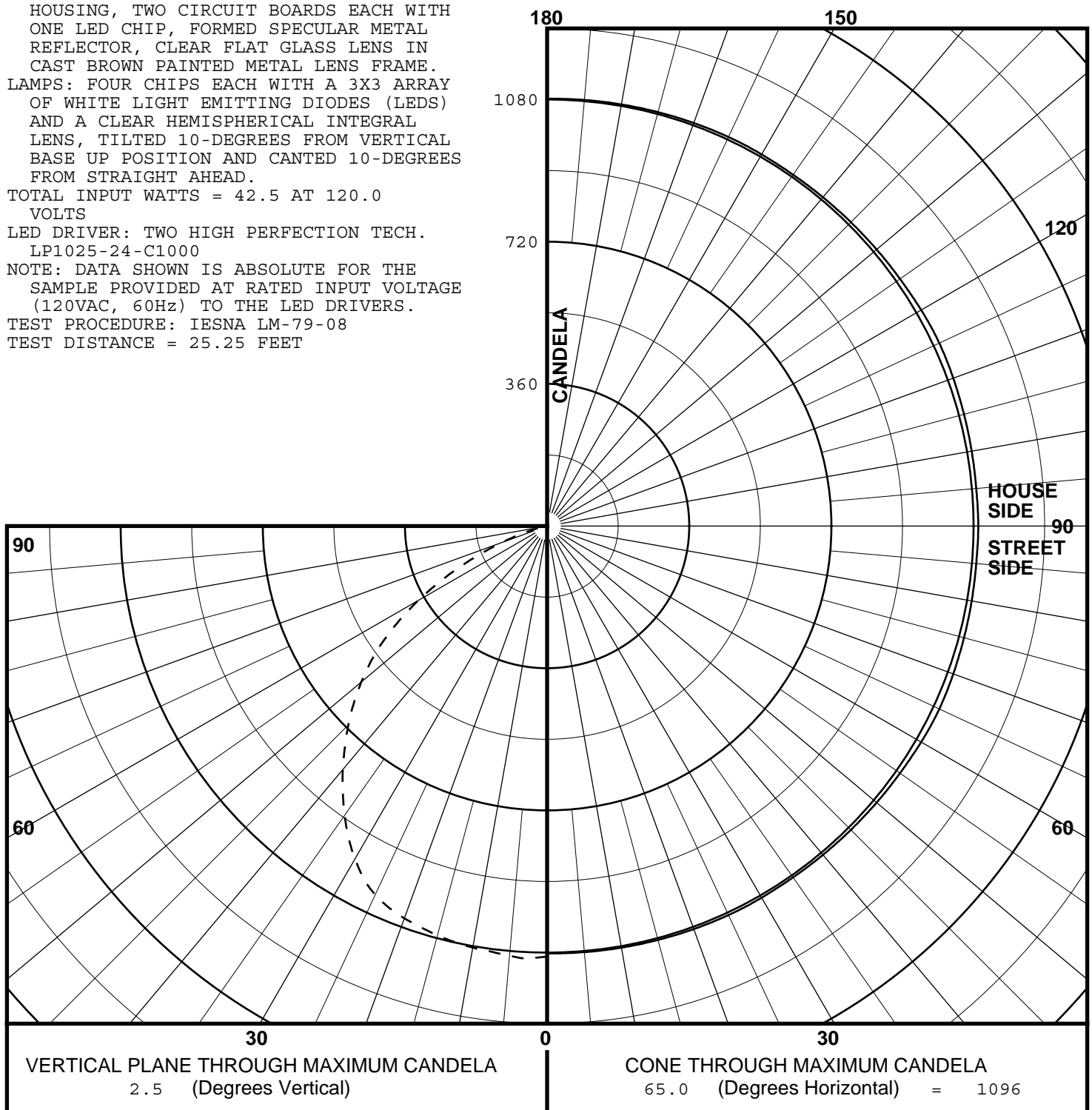
LED DRIVER: TWO HIGH PERFECTION TECH. LP1025-24-C1000

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE (120VAC, 60Hz) TO THE LED DRIVERS.

TEST PROCEDURE: IESNA LM-79-08

TEST DISTANCE = 25.25 FEET

MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA

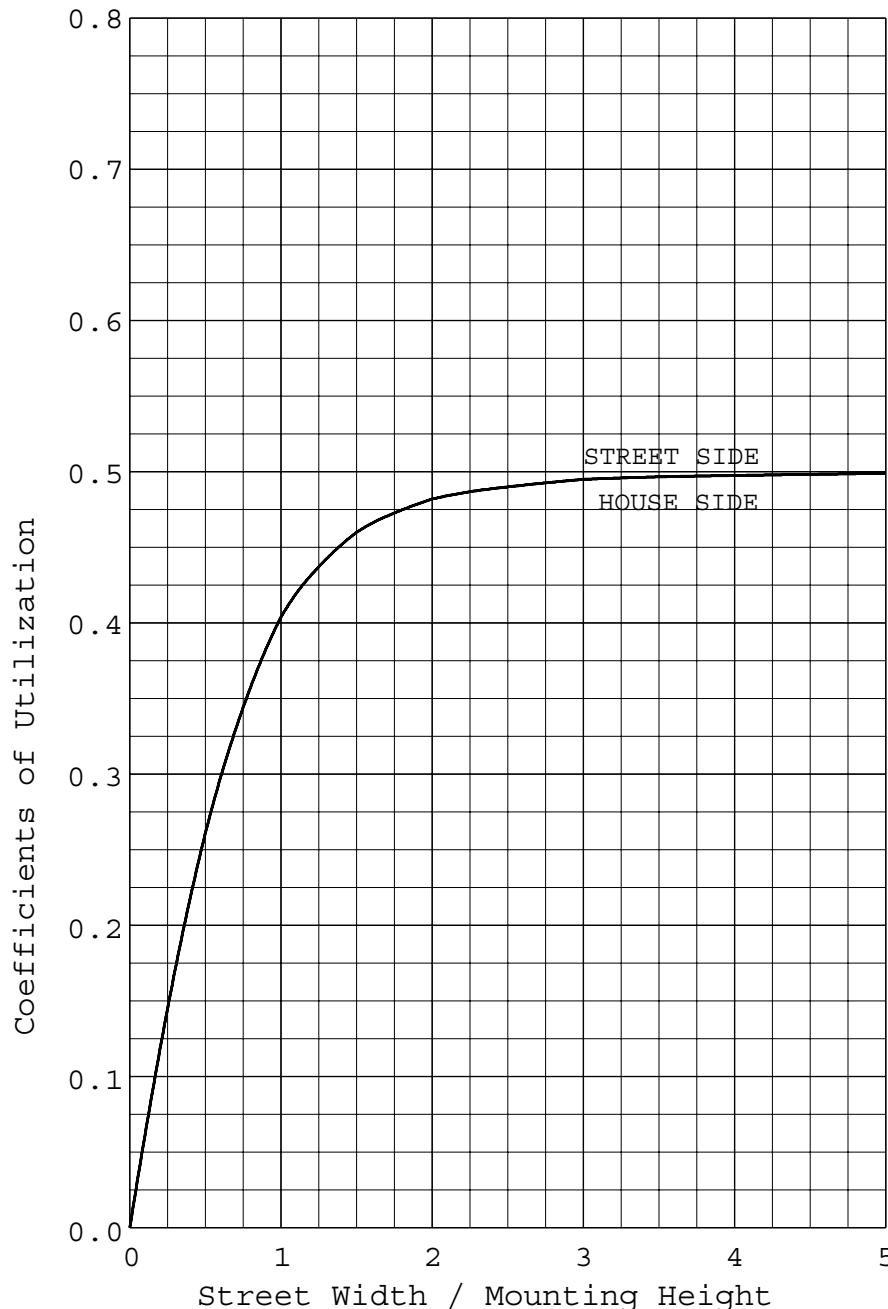




REPORT NUMBER: ITL69258
ISSUE DATE: 07/05/11
PREPARED FOR: RAB LIGHTING, INC.

PAGE: 3 OF 6

COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



| | LUMENS | PERCENT OF FIXTURE |
|-------------------------|--------|-----------------------|
| DOWNWARD STREET SIDE | 1373 | 50.0 |
| DOWNWARD HOUSE SIDE | 1373 | 50.0 |
| DOWNWARD TOTAL | 2746 | 100.0 |
| UPWARD STREET SIDE | 0 | 0.0 |
| UPWARD HOUSE SIDE | 0 | 0.0 |
| UPWARD TOTAL | 0 | 0.0 |
| TOTAL FLUX | 2746 | 100.0 |
| EFFICACY = 64.6 Lm/W | | |

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



itl boulder
THE LIGHT CENTER OF THE INDUSTRY SINCE 1955



INDEPENDENT TESTING LABORATORIES, INC.
3386 LONGHORN ROAD, BOULDER, CO 80302 USA

PHONE: (303)442-1255 • FAX: (303)449-5274 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

REPORT NUMBER: ITL69258
ISSUE DATE: 07/05/11
PREPARED FOR: RAB LIGHTING, INC.

PAGE: 4 OF 6

FLUX DISTRIBUTION BY SOLID ANGLE

(PER IESNA TM-15-07, LUMINAIRE CLASSIFICATION
SYSTEM FOR OUTDOOR LUMINAIRES)

| | LUMENS | PERCENT OF FIXTURE | BUG ZONE RATINGS |
|---------------|--------|--------------------------|------------------------|
| FORWARD LIGHT | 1373. | 50.0 | |
| FL (0- 30) | 437.2 | 15.9 | |
| FM (30- 60) | 774.9 | 28.2 | |
| FH (60- 80) | 157.9 | 5.8 | G0 |
| FVH(80- 90) | 2.9 | 0.1 | U0 G0 |
| BACK LIGHT | 1373. | 50.0 | |
| BL (0- 30) | 437.2 | 15.9 | B1 |
| BM (30- 60) | 774.9 | 28.2 | B1 |
| BH (60- 80) | 157.9 | 5.8 | B1 G0 |
| BVH(80- 90) | 2.9 | 0.1 | U0 G0 |
| UPLIGHT | 0. | 0.0 | |
| UL (90-100) | 0.1 | 0.0 | U1 |
| UH (100-180) | 0.0 | 0.0 | U0 |
| TRAPPED LIGHT | 0. | 0.0 | |
| TOTAL FLUX | 2746. | 100.0 | |

BACKLIGHT, UPLIGHT, AND GLARE (BUG) RATINGS
(PER ADDENDUM A FOR IESNA TM-15-07)

BUG RATING: B1 U1 G0



INDEPENDENT TESTING LABORATORIES, INC.
3386 LONGHORN ROAD, BOULDER, CO 80302 USA

PHONE: (303)442-1255 • FAX: (303)449-5274 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

REPORT NUMBER: ITL69258
ISSUE DATE: 07/05/11
PREPARED FOR: RAB LIGHTING, INC.

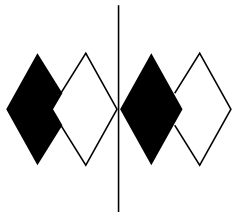
PAGE: 5 OF 6

CANDELA TABULATION

| | | LATERAL ANGLE | | | | | | | | | | |
|---|-------|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | 0.0 | 5.0 | 15.0 | 25.0 | 35.0 | 45.0 | 55.0 | 65.0 | 75.0 | 85.0 | 90.0 |
| | 180.0 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| | 175.0 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| | 165.0 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| | 155.0 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| | 145.0 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| | 135.0 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| | 125.0 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| | 115.0 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| | 105.0 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| | 95.0 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| | 92.5 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| | 90.0 | 2. | 2. | 1. | 1. | 1. | 1. | 1. | 1. | 0. | 0. | 0. |
| | 87.5 | 4. | 4. | 3. | 4. | 3. | 3. | 2. | 2. | 2. | 1. | 1. |
| | 85.0 | 6. | 6. | 5. | 5. | 5. | 4. | 4. | 4. | 3. | 3. | 3. |
| V | 82.5 | 8. | 8. | 8. | 9. | 8. | 8. | 7. | 7. | 6. | 6. | 5. |
| E | 80.0 | 13. | 14. | 14. | 15. | 15. | 14. | 12. | 10. | 9. | 9. | 9. |
| R | 77.5 | 25. | 25. | 29. | 32. | 32. | 30. | 26. | 19. | 15. | 14. | 13. |
| T | 75.0 | 65. | 64. | 61. | 61. | 59. | 56. | 50. | 42. | 32. | 26. | 25. |
| I | 72.5 | 117. | 117. | 115. | 108. | 98. | 91. | 85. | 77. | 69. | 62. | 60. |
| C | 70.0 | 176. | 174. | 168. | 161. | 150. | 138. | 128. | 121. | 116. | 117. | 119. |
| A | 67.5 | 223. | 224. | 226. | 218. | 202. | 190. | 183. | 177. | 175. | 174. | 175. |
| L | 65.0 | 281. | 281. | 275. | 267. | 256. | 246. | 243. | 242. | 238. | 234. | 233. |
| | 62.5 | 324. | 324. | 325. | 319. | 314. | 309. | 307. | 309. | 307. | 306. | 303. |
| A | 60.0 | 372. | 372. | 372. | 374. | 374. | 375. | 374. | 376. | 376. | 382. | 380. |
| N | 57.5 | 428. | 428. | 428. | 430. | 435. | 443. | 444. | 442. | 443. | 445. | 443. |
| G | 55.0 | 487. | 486. | 487. | 492. | 495. | 504. | 505. | 505. | 504. | 504. | 502. |
| L | 52.5 | 546. | 546. | 547. | 554. | 557. | 561. | 564. | 562. | 561. | 559. | 558. |
| E | 50.0 | 604. | 604. | 606. | 612. | 615. | 616. | 618. | 614. | 614. | 609. | 610. |
| | 47.5 | 658. | 658. | 663. | 667. | 667. | 667. | 668. | 664. | 662. | 656. | 659. |
| | 45.0 | 711. | 712. | 714. | 717. | 717. | 715. | 717. | 712. | 707. | 700. | 704. |
| | 42.5 | 759. | 758. | 762. | 767. | 765. | 764. | 764. | 758. | 753. | 747. | 749. |
| | 40.0 | 801. | 803. | 805. | 812. | 812. | 813. | 812. | 805. | 798. | 795. | 795. |
| | 37.5 | 842. | 843. | 845. | 852. | 858. | 862. | 860. | 850. | 844. | 840. | 841. |
| | 35.0 | 881. | 880. | 882. | 890. | 903. | 910. | 905. | 894. | 889. | 886. | 887. |
| | 30.0 | 952. | 952. | 948. | 957. | 972. | 987. | 977. | 973. | 972. | 972. | 978. |
| | 25.0 | 1006. | 1004. | 997. | 1005. | 1014. | 1026. | 1030. | 1030. | 1034. | 1042. | 1051. |
| | 20.0 | 1043. | 1039. | 1035. | 1038. | 1040. | 1049. | 1056. | 1057. | 1067. | 1078. | 1083. |
| | 15.0 | 1060. | 1058. | 1059. | 1059. | 1057. | 1064. | 1069. | 1073. | 1080. | 1080. | 1081. |
| | 10.0 | 1072. | 1072. | 1074. | 1074. | 1071. | 1076. | 1079. | 1084. | 1085. | 1083. | 1084. |
| | 5.0 | 1078. | 1079. | 1082. | 1083. | 1081. | 1084. | 1087. | 1092. | 1089. | 1087. | 1087. |
| | 2.5<< | 1082. | 1083. | 1085. | 1087. | 1086. | 1088. | 1091. | 1096. | 1093. | 1091. | 1092. |
| | 0.0 | 1090. | 1090. | 1090. | 1090. | 1090. | 1090. | 1090. | 1090. | 1090. | 1090. | 1090. |

PLANE OF MAXIMUM CANDELA

CONE OF MAXIMUM CANDELA



itl boulder
THE LIGHT CENTER OF THE INDUSTRY SINCE 1955



INDEPENDENT TESTING LABORATORIES, INC.
3386 LONGHORN ROAD, BOULDER, CO 80302 USA

PHONE: (303)442-1255 • FAX: (303)449-5274 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

REPORT NUMBER: ITL69258
ISSUE DATE: 07/05/11
PREPARED FOR: RAB LIGHTING, INC.

PAGE: 6 OF 6

ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

THIS ITL REPORT WITH THE USE OF THE NVLAP LOGO SHALL NOT BE USED BY THE CLIENT TO CLAIM PRODUCT CERTIFICATION, APPROVAL, OR ENDORSEMENT BY NVLAP, NIST, OR ANY AGENCY OF THE FEDERAL GOVERNMENT.



INDEPENDENT TESTING LABORATORIES, INC.
3386 LONGHORN ROAD, BOULDER, CO 80302 USA

PHONE: (303)442-1255 • FAX: (303)449-5274 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

REPORT NUMBER: ITL69260

DATE: 07/14/11

PREPARED FOR: RAB LIGHTING, INC.

Page 1 of 3

ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

CATALOG NUMBER: CLED2X20 / PLED2X20

LUMINAIRE: ONE LUMINAIRE CONSISTING OF TWO OPPOSING LIGHT HEADS, EACH LIGHT HEAD CONSISTING OF: CAST FINNED METAL HOUSING, TWO CIRCUIT BOARDS EACH WITH ONE LED CHIP, FORMED SPECULAR METAL REFLECTOR, CLEAR FLAT GLASS LENS IN CAST BROWN PAINTED METAL LENS FRAME.

LAMPS: FOUR CHIPS EACH WITH A 3X3 ARRAY OF WHITE LIGHT EMITTING DIODES (LEDs) AND A CLEAR HEMISPHERICAL INTEGRAL LENS, TILTED 10-DEGREES FROM VERTICAL BASE UP POSITION AND CANTED 10-DEGREES FROM STRAIGHT AHEAD.

DRIVERS: TWO HIGH PERFECTION TECH. LP1025-24-C1000

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE (120VAC, 60HZ) TO THE LED DRIVERS.

INSTRUMENTS: Kikusui PCR500L AC Power Source
Yokogawa WT210 Digital Power Meter
Optronic Laboratories OL770 Spectroradiometer
ITL 1.5 Meter Diameter Integrating Sphere, 4π Geometry

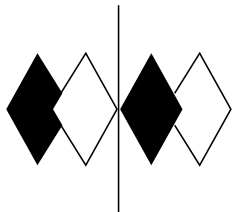
OBJECT OF TEST: Measure the Spectral Power Distribution (SPD), Correlated Color Temperature (CCT), Color Rendering Index (CRIa), Chromaticity Coordinates (x,y,u',v'), ANSI C78.377 Duv, and electrical data including Power Factor (PF), Total Harmonic Distortion (THD), and Off-State Power to the luminaire.

PROCEDURE: The luminaire was provided by the customer and had an unknown number of burn hours. The luminaire was mounted inside the integrating sphere in a horizontal position (LEDs facing down). The luminaire was allowed to stabilize at 120VAC input. After stabilization occurred, Spectral Power Distribution (SPD), Correlated Color Temperature (CCT), Color Rendering Index (CRIa), Chromaticity Coordinates (x,y,u',v'), ANSI C78.377 Duv, and electrical data including Power Factor (PF), Total Harmonic Distortion (THD), and Off-State Power were measured with the luminaire operating in the integrating sphere. In order to measure mean performance, multiple data sets were recorded and averaged. Readings were taken with the luminaire operating at 120VAC input in a 25 +/-1 degree Celsius free air ambient and in accordance with IESNA LM-79-08. All data are traceable to the National Institute of Standards and Technology.

RESULTS: (continued subsequent pages)

THIS ITL REPORT WITH THE USE OF THE NVLAP LOGO SHALL NOT BE USED BY THE CLIENT TO CLAIM PRODUCT CERTIFICATION, APPROVAL, OR ENDORSEMENT BY NVLAP, NIST, OR ANY AGENCY OF THE FEDERAL GOVERNMENT.

| | |
|----------|-------------------------------------|
| Checked | <u>L Brockman</u> |
| Approved | <u>N Gully</u> Lighting Engineer |



itl boulder

THE LIGHT CENTER OF THE INDUSTRY SINCE 1955



NVLAP LAB CODE: 200925-0

INDEPENDENT TESTING LABORATORIES, INC.
3386 LONGHORN ROAD, BOULDER, CO 80302 USA

PHONE: (303)442-1255 • FAX: (303)449-5274 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

REPORT NUMBER: ITL69260

DATE: 07/14/11

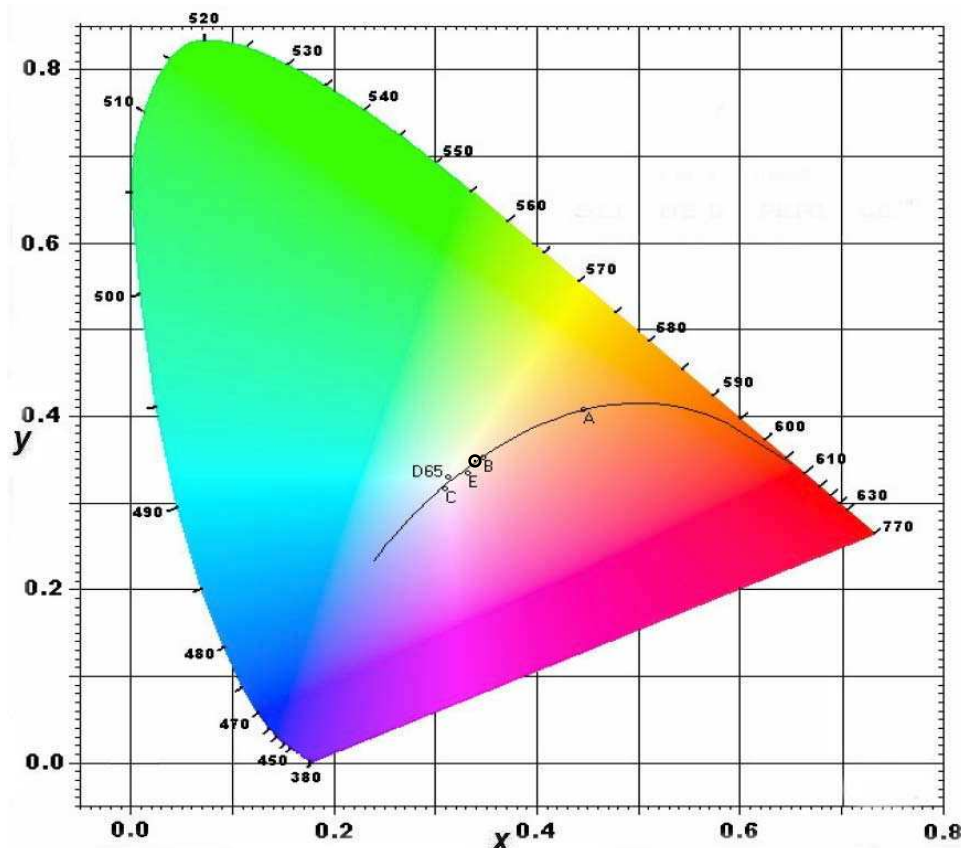
PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: CLED2X20 / PLED2X20

Page 2 of 3

RESULTS:

CIE Chromaticity Diagram



| SPECTRORADIOMETRIC | |
|--------------------------------------|-------------------|
| Observer | CIE 1931 2 degree |
| Chromaticity Ordinate x | 0.3388 |
| Chromaticity Ordinate y | 0.3481 |
| Chromaticity Ordinate u' | 0.2085 |
| Chromaticity Ordinate v' | 0.4820 |
| Correlated Color Temp CCT (K) | 5237 |
| Color Rendering Index (CRIa) | 66 |
| Color Rendering Index 9 (Strong red) | -63 |
| Total Radiant Flux (milliWatts) | 8123 |
| ANSI C78.377-2008 Duv | 0.001 |
| ELECTRICAL | |
| Input Voltage (Volts AC) | 120.0 |
| Input Current (mA AC) | 356 |
| Input Power (Watts) | 42.5 |
| Input Power Factor (%) | 99.5 |
| Input Current THD (%) | 6.5 |
| Input Voltage THD (%) | 0.0 |
| Off State Power (Watts) | 0.0 |

PHONE: (303)442-1255 • FAX: (303)449-5274 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

REPORT NUMBER: ITL69260
DATE: 07/14/11
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: CLED2X20 / PLED2X20

Page 3 of 3

RESULTS:

| Wavelength | mW per nm | Wavelength | mW per nm | Wavelength | mW per nm |
|------------|-----------|------------|-----------|------------|-----------|
| 380 | 0.962 | 515 | 24.907 | 650 | 12.841 |
| 385 | 0.941 | 520 | 28.654 | 655 | 11.193 |
| 390 | 0.990 | 525 | 32.311 | 660 | 9.723 |
| 395 | 1.078 | 530 | 35.668 | 665 | 8.418 |
| 400 | 1.230 | 535 | 38.406 | 670 | 7.293 |
| 405 | 1.645 | 540 | 41.239 | 675 | 6.284 |
| 410 | 2.370 | 545 | 43.771 | 680 | 5.439 |
| 415 | 3.461 | 550 | 46.154 | 685 | 4.683 |
| 420 | 5.517 | 555 | 48.119 | 690 | 4.034 |
| 425 | 9.295 | 560 | 49.681 | 695 | 3.487 |
| 430 | 16.006 | 565 | 50.624 | 700 | 2.990 |
| 435 | 26.811 | 570 | 50.933 | 705 | 2.574 |
| 440 | 43.913 | 575 | 50.520 | 710 | 2.220 |
| 445 | 66.281 | 580 | 49.411 | 715 | 1.910 |
| 450 | 75.661 | 585 | 47.679 | 720 | 1.644 |
| 455 | 62.094 | 590 | 45.470 | 725 | 1.414 |
| 460 | 42.766 | 595 | 42.837 | 730 | 1.220 |
| 465 | 29.512 | 600 | 39.873 | 735 | 1.049 |
| 470 | 20.613 | 605 | 36.779 | 740 | 0.903 |
| 475 | 14.724 | 610 | 33.579 | 745 | 0.783 |
| 480 | 11.370 | 615 | 30.409 | 750 | 0.682 |
| 485 | 9.812 | 620 | 27.321 | 755 | 0.596 |
| 490 | 9.661 | 625 | 24.375 | 760 | 0.516 |
| 495 | 10.907 | 630 | 21.601 | 765 | 0.451 |
| 500 | 13.495 | 635 | 19.093 | 770 | 0.390 |
| 505 | 16.945 | 640 | 16.822 | 775 | 0.341 |
| 510 | 20.824 | 645 | 14.690 | 780 | 0.302 |

