

Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions

Brand: NEO-RAY

Report Number: P920484

Luminaire Tested: DFN2DIP-SQ4F0-110D060US935-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P920484  
REPORT IS A COMBINATION OF REPORTS P900069 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-110D060US935-FLLFLL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

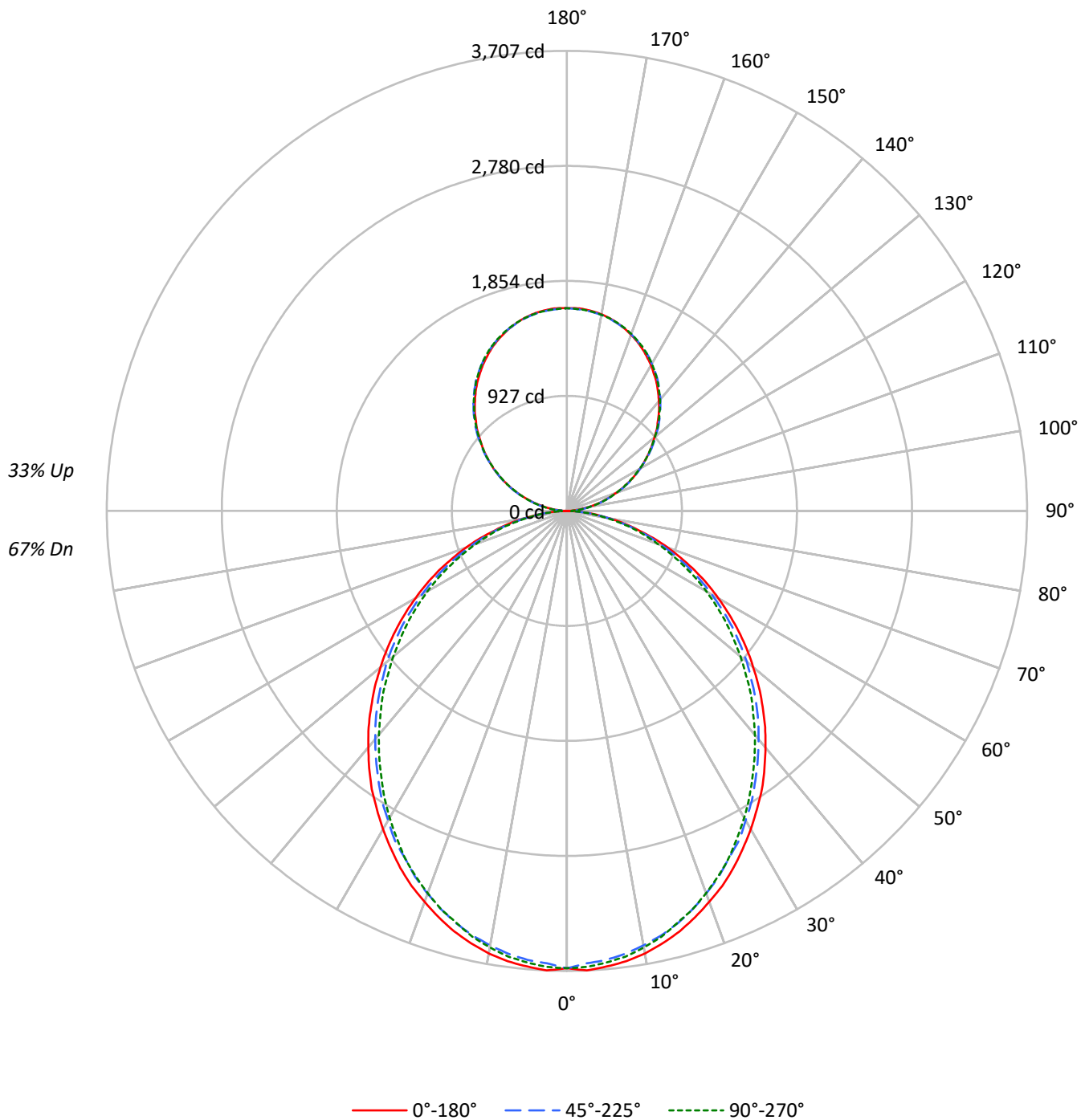
Lumens per Lamp: N/A  
Luminaire Lumens: 13948.2 lumens  
Efficiency: N/A  
Efficacy: 92.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 150.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9951  
Total Harmonic Distortion (THDi): 0.07  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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CATALOG NUMBER: DFN2DIP-SQ4F0-110D060US935-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P920484

CATALOG NUMBER: DFN2DIP-SQ4F0-110D060US935-FLLFL

**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|
| RF  | 20  |     |     |     | 20  |     |     |     | 20 |    |    |    | 20 |    |    |    | 20 |
| RC  | 80  |     |     |     | 70  |     |     |     | 50 |    |    |    | 30 |    |    |    | 10 |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 |
| RCR |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |
| 0   | 111 | 111 | 111 | 111 | 105 | 105 | 105 | 105 | 93 | 93 | 93 | 82 | 82 | 82 | 72 | 72 | 72 |
| 1   | 102 | 97  | 93  | 90  | 96  | 92  | 88  | 85  | 82 | 79 | 76 | 72 | 70 | 68 | 64 | 62 | 61 |
| 2   | 93  | 85  | 79  | 73  | 87  | 80  | 75  | 70  | 72 | 67 | 63 | 63 | 60 | 57 | 56 | 54 | 51 |
| 3   | 85  | 75  | 67  | 61  | 79  | 71  | 64  | 58  | 63 | 58 | 53 | 56 | 52 | 48 | 50 | 46 | 44 |
| 4   | 77  | 66  | 58  | 52  | 73  | 63  | 55  | 50  | 56 | 50 | 46 | 50 | 45 | 42 | 44 | 41 | 38 |
| 5   | 71  | 59  | 51  | 45  | 67  | 56  | 49  | 43  | 50 | 44 | 39 | 45 | 40 | 36 | 40 | 36 | 33 |
| 6   | 66  | 53  | 45  | 39  | 62  | 51  | 43  | 37  | 45 | 39 | 35 | 41 | 36 | 32 | 36 | 32 | 29 |
| 7   | 61  | 48  | 40  | 34  | 57  | 46  | 38  | 33  | 41 | 35 | 31 | 37 | 32 | 28 | 33 | 29 | 26 |
| 8   | 56  | 44  | 36  | 30  | 53  | 42  | 34  | 29  | 38 | 32 | 27 | 34 | 29 | 25 | 31 | 26 | 23 |
| 9   | 53  | 40  | 32  | 27  | 50  | 38  | 31  | 26  | 35 | 29 | 24 | 31 | 26 | 23 | 28 | 24 | 21 |
| 10  | 49  | 37  | 29  | 24  | 46  | 35  | 28  | 24  | 32 | 26 | 22 | 29 | 24 | 21 | 26 | 22 | 19 |

**AVERAGE LUMINANCE (cd/sqm):**

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2586 | 2586 | 2586 |
| 5°  | 2590 | 2550 | 2568 |
| 10° | 2569 | 2516 | 2534 |
| 15° | 2531 | 2476 | 2480 |
| 20° | 2480 | 2418 | 2425 |
| 25° | 2429 | 2350 | 2362 |
| 30° | 2366 | 2287 | 2281 |
| 35° | 2305 | 2212 | 2195 |
| 40° | 2231 | 2136 | 2113 |
| 45° | 2157 | 2060 | 2030 |
| 50° | 2076 | 1980 | 1933 |
| 55° | 1991 | 1888 | 1845 |
| 60° | 1895 | 1779 | 1743 |
| 65° | 1791 | 1666 | 1623 |
| 70° | 1658 | 1528 | 1495 |
| 75° | 1473 | 1363 | 1377 |
| 80° | 1252 | 1152 | 1151 |
| 85° | 905  | 789  | 773  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 2157 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 346.9   | 2.5       |
| 10°-20°   | 975.9   | 7.0       |
| 20°-30°   | 1434.2  | 10.3      |
| 30°-40°   | 1665.7  | 11.9      |
| 40°-50°   | 1663.7  | 11.9      |
| 50°-60°   | 1450.7  | 10.4      |
| 60°-70°   | 1072.4  | 7.7       |
| 70°-80°   | 606.7   | 4.3       |
| 80°-90°   | 164.8   | 1.2       |
| 90°-100°  | 101.1   | 0.7       |
| 100°-110° | 321.2   | 2.3       |
| 110°-120° | 549.7   | 3.9       |
| 120°-130° | 723.0   | 5.2       |
| 130°-140° | 811.5   | 5.8       |
| 140°-150° | 795.8   | 5.7       |
| 150°-160° | 667.5   | 4.8       |
| 160°-170° | 442.7   | 3.2       |
| 170°-180° | 154.7   | 1.1       |
| 0°-30°    | 2757.0  | 19.8      |
| 0°-40°    | 4422.7  | 31.7      |
| 0°-60°    | 7537.0  | 54.0      |
| 0°-90°    | 9380.9  | 67.3      |
| 90°-120°  | 972.0   | 7.0       |
| 90°-150°  | 3302.3  | 23.7      |
| 90°-180°  | 4567.0  | 32.7      |
| 0°-180°   | 13948.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3685 | 3685  | 3685 | 3685  | 3685 |      |
| 5°   | 3685 | 3671  | 3632 | 3660  | 3654 | 350  |
| 15°  | 3508 | 3487  | 3441 | 3455  | 3437 | 988  |
| 25°  | 3175 | 3147  | 3087 | 3094  | 3087 | 1461 |
| 35°  | 2739 | 2704  | 2647 | 2626  | 2608 | 1711 |
| 45°  | 2229 | 2204  | 2151 | 2112  | 2098 | 1720 |
| 55°  | 1687 | 1666  | 1623 | 1580  | 1563 | 1508 |
| 65°  | 1138 | 1116  | 1081 | 1049  | 1031 | 1125 |
| 75°  | 595  | 588   | 570  | 549   | 556  | 635  |
| 85°  | 145  | 142   | 138  | 127   | 124  | 162  |
| 90°  | 2    | 18    | 48   | 45    | 47   | 13   |
| 95°  | 72   | 86    | 88   | 88    | 86   | 80   |
| 105° | 296  | 300   | 303  | 306   | 306  | 313  |
| 115° | 552  | 560   | 557  | 556   | 552  | 546  |
| 125° | 802  | 815   | 811  | 806   | 805  | 717  |
| 135° | 1038 | 1053  | 1056 | 1055  | 1051 | 802  |
| 145° | 1260 | 1270  | 1278 | 1279  | 1274 | 787  |
| 155° | 1441 | 1445  | 1449 | 1456  | 1452 | 663  |
| 165° | 1567 | 1566  | 1566 | 1576  | 1569 | 442  |
| 175° | 1631 | 1627  | 1624 | 1634  | 1625 | 155  |
| 180° | 1634 | 1634  | 1634 | 1634  | 1634 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3685.2 | 3685.2 | 3685.2 | 3685.2 | 3685.2 |
| 2.5°   | 3706.6 | 3688.9 | 3649.9 | 3685.2 | 3678.4 |
| 5°     | 3685.2 | 3671.3 | 3632.2 | 3660.4 | 3653.6 |
| 7.5°   | 3660.4 | 3639.4 | 3600.3 | 3628.8 | 3621.7 |
| 10°    | 3621.7 | 3596.8 | 3554.4 | 3582.5 | 3572.0 |
| 12.5°  | 3568.3 | 3547.2 | 3504.8 | 3522.4 | 3515.3 |
| 15°    | 3508.1 | 3487.0 | 3440.8 | 3455.1 | 3437.4 |
| 17.5°  | 3433.7 | 3412.7 | 3366.4 | 3384.1 | 3366.4 |
| 20°    | 3352.1 | 3331.0 | 3281.4 | 3291.9 | 3278.1 |
| 22.5°  | 3270.9 | 3238.9 | 3192.7 | 3192.7 | 3185.5 |
| 25°    | 3175.0 | 3146.9 | 3086.7 | 3093.5 | 3086.7 |
| 27.5°  | 3068.6 | 3043.8 | 2997.9 | 2987.4 | 2969.8 |
| 30°    | 2962.6 | 2934.0 | 2881.0 | 2870.5 | 2856.2 |
| 32.5°  | 2849.0 | 2828.0 | 2771.2 | 2749.8 | 2735.5 |
| 35°    | 2739.3 | 2704.0 | 2647.1 | 2625.7 | 2608.0 |
| 37.5°  | 2615.2 | 2583.3 | 2526.5 | 2501.6 | 2484.0 |
| 40°    | 2487.8 | 2459.2 | 2402.4 | 2370.8 | 2356.6 |
| 42.5°  | 2363.7 | 2335.1 | 2278.7 | 2243.0 | 2222.0 |
| 45°    | 2229.1 | 2204.2 | 2150.9 | 2112.2 | 2097.9 |
| 47.5°  | 2097.9 | 2073.1 | 2016.3 | 1977.2 | 1956.1 |
| 50°    | 1959.5 | 1941.9 | 1892.2 | 1842.6 | 1825.0 |
| 52.5°  | 1825.0 | 1800.1 | 1754.3 | 1715.1 | 1690.3 |
| 55°    | 1687.0 | 1665.5 | 1623.1 | 1580.5 | 1562.9 |
| 57.5°  | 1548.6 | 1530.9 | 1484.7 | 1442.2 | 1427.9 |
| 60°    | 1410.2 | 1396.4 | 1346.7 | 1307.6 | 1297.1 |
| 62.5°  | 1275.7 | 1250.9 | 1215.5 | 1180.2 | 1165.9 |
| 65°    | 1137.6 | 1116.2 | 1080.9 | 1049.0 | 1031.3 |
| 67.5°  | 995.9  | 977.9  | 946.3  | 921.5  | 907.2  |
| 70°    | 864.7  | 850.4  | 818.5  | 793.7  | 779.7  |
| 72.5°  | 730.1  | 715.8  | 698.2  | 673.4  | 662.8  |
| 75°    | 595.1  | 588.4  | 570.3  | 549.3  | 556.5  |
| 77.5°  | 474.8  | 460.5  | 453.4  | 442.9  | 432.4  |
| 80°    | 354.6  | 350.8  | 343.6  | 333.1  | 326.0  |
| 82.5°  | 241.0  | 241.0  | 237.6  | 223.3  | 223.3  |
| 85°    | 145.2  | 141.7  | 138.4  | 127.4  | 124.1  |
| 87.5°  | 63.9   | 56.7   | 49.6   | 39.1   | 35.3   |
| 90°    | 1.5    | 17.7   | 48.3   | 45.3   | 46.8   |
| 92.5°  | 30.6   | 41.4   | 42.9   | 44.3   | 44.3   |
| 95°    | 71.9   | 85.7   | 88.2   | 88.2   | 85.7   |
| 97.5°  | 119.7  | 132.5  | 137.9  | 137.9  | 137.9  |
| 100°   | 174.9  | 186.1  | 190.1  | 190.1  | 188.6  |
| 102.5° | 233.0  | 241.3  | 246.8  | 248.2  | 246.8  |
| 105°   | 296.5  | 300.5  | 303.4  | 305.9  | 305.9  |
| 107.5° | 359.6  | 365.5  | 365.5  | 366.4  | 359.6  |
| 110°   | 420.7  | 428.5  | 428.5  | 428.5  | 424.6  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 486.6  | 495.0  | 493.5  | 489.6  | 486.6  |
| 115°   | 551.6  | 559.6  | 557.1  | 555.6  | 551.6  |
| 117.5° | 616.2  | 627.1  | 620.1  | 616.2  | 612.3  |
| 120°   | 681.2  | 692.1  | 681.2  | 681.2  | 676.7  |
| 122.5° | 740.3  | 754.1  | 747.2  | 743.3  | 740.3  |
| 125°   | 802.4  | 814.7  | 810.7  | 806.3  | 804.9  |
| 127.5° | 863.0  | 878.2  | 872.8  | 866.9  | 863.0  |
| 130°   | 919.6  | 937.4  | 934.9  | 931.9  | 926.5  |
| 132.5° | 983.2  | 996.9  | 997.9  | 991.0  | 987.0  |
| 135°   | 1037.8 | 1053.1 | 1056.0 | 1054.6 | 1050.6 |
| 137.5° | 1098.9 | 1111.2 | 1113.7 | 1112.7 | 1106.8 |
| 140°   | 1152.6 | 1164.9 | 1171.8 | 1171.8 | 1166.4 |
| 142.5° | 1207.7 | 1220.0 | 1224.0 | 1225.5 | 1220.0 |
| 145°   | 1260.0 | 1269.8 | 1277.7 | 1279.2 | 1273.8 |
| 147.5° | 1306.7 | 1319.0 | 1325.0 | 1327.4 | 1322.0 |
| 150°   | 1355.0 | 1363.4 | 1368.8 | 1373.2 | 1368.8 |
| 152.5° | 1397.8 | 1406.3 | 1413.2 | 1418.6 | 1413.2 |
| 155°   | 1440.7 | 1444.7 | 1449.1 | 1456.0 | 1451.6 |
| 157.5° | 1477.6 | 1480.7 | 1483.1 | 1493.0 | 1486.1 |
| 160°   | 1510.7 | 1513.6 | 1515.1 | 1523.4 | 1517.6 |
| 162.5° | 1541.2 | 1541.2 | 1542.6 | 1552.0 | 1545.1 |
| 165°   | 1567.3 | 1565.8 | 1565.8 | 1575.7 | 1568.8 |
| 167.5° | 1591.0 | 1586.6 | 1586.6 | 1596.4 | 1589.5 |
| 170°   | 1608.7 | 1604.7 | 1603.3 | 1613.1 | 1604.7 |
| 172.5° | 1621.0 | 1617.0 | 1615.6 | 1625.4 | 1617.0 |
| 175°   | 1630.8 | 1626.9 | 1623.9 | 1633.8 | 1625.4 |
| 177.5° | 1636.2 | 1632.4 | 1629.4 | 1637.7 | 1629.4 |
| 180°   | 1633.8 | 1633.8 | 1633.8 | 1633.8 | 1633.8 |

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**CIE UGR TABLE:**

| Reflectances:   |      |                  |       |       |       |       |                |       |       |       |       |
|-----------------|------|------------------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|
| Ceiling         |      | 0.7              | 0.7   | 0.5   | 0.5   | 0.3   | 0.7            | 0.7   | 0.5   | 0.5   | 0.3   |
| Wall            |      | 0.5              | 0.3   | 0.5   | 0.3   | 0.3   | 0.5            | 0.3   | 0.5   | 0.3   | 0.3   |
| Reference plane |      | 0.2              | 0.2   | 0.2   | 0.2   | 0.2   | 0.2            | 0.2   | 0.2   | 0.2   | 0.2   |
| Room dimensions |      | Viewed crosswise |       |       |       |       | Viewed endwise |       |       |       |       |
| X=2H            | Y=2H | 12.04            | 13.08 | 12.84 | 13.90 | 14.90 | 11.60          | 12.64 | 12.39 | 13.45 | 14.46 |
|                 | 3H   | 13.72            | 14.65 | 14.53 | 15.48 | 16.51 | 13.23          | 14.16 | 14.04 | 14.99 | 16.02 |
|                 | 4H   | 14.32            | 15.20 | 15.14 | 16.04 | 17.08 | 13.82          | 14.71 | 14.65 | 15.54 | 16.58 |
|                 | 6H   | 14.73            | 15.55 | 15.57 | 16.39 | 17.44 | 14.23          | 15.05 | 15.07 | 15.89 | 16.94 |
|                 | 8H   | 14.84            | 15.62 | 15.69 | 16.48 | 17.53 | 14.34          | 15.12 | 15.19 | 15.98 | 17.03 |
|                 | 12H  | 14.90            | 15.64 | 15.75 | 16.49 | 17.57 | 14.39          | 15.13 | 15.24 | 15.98 | 17.06 |
| 4H              | 2H   | 12.52            | 13.41 | 13.35 | 14.24 | 15.28 | 12.17          | 13.05 | 13.00 | 13.89 | 14.93 |
|                 | 3H   | 14.41            | 15.15 | 15.25 | 16.02 | 17.07 | 14.00          | 14.74 | 14.84 | 15.61 | 16.67 |
|                 | 4H   | 15.14            | 15.81 | 15.99 | 16.67 | 17.76 | 14.71          | 15.38 | 15.57 | 16.25 | 17.33 |
|                 | 6H   | 15.67            | 16.25 | 16.53 | 17.14 | 18.22 | 15.23          | 15.82 | 16.10 | 16.70 | 17.79 |
|                 | 8H   | 15.82            | 16.37 | 16.69 | 17.25 | 18.35 | 15.38          | 15.93 | 16.26 | 16.81 | 17.91 |
|                 | 12H  | 15.91            | 16.40 | 16.80 | 17.30 | 18.41 | 15.46          | 15.95 | 16.35 | 16.85 | 17.96 |
| 8H              | 4H   | 15.35            | 15.89 | 16.22 | 16.77 | 17.88 | 14.97          | 15.51 | 15.84 | 16.40 | 17.50 |
|                 | 6H   | 15.99            | 16.44 | 16.89 | 17.37 | 18.47 | 15.61          | 16.06 | 16.51 | 16.98 | 18.08 |
|                 | 8H   | 16.22            | 16.62 | 17.13 | 17.53 | 18.65 | 15.82          | 16.22 | 16.73 | 17.14 | 18.26 |
|                 | 12H  | 16.36            | 16.71 | 17.27 | 17.62 | 18.79 | 15.95          | 16.30 | 16.86 | 17.21 | 18.38 |
| 12H             | 4H   | 15.34            | 15.83 | 16.23 | 16.73 | 17.84 | 14.97          | 15.46 | 15.87 | 16.37 | 17.47 |
|                 | 6H   | 16.02            | 16.42 | 16.93 | 17.34 | 18.46 | 15.65          | 16.05 | 16.56 | 16.97 | 18.09 |
|                 | 8H   | 16.28            | 16.63 | 17.19 | 17.54 | 18.71 | 15.90          | 16.25 | 16.81 | 17.16 | 18.33 |