

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: P915714

Luminaire Tested: DFN2DIP-TR4F0-110D060US927-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P915714  
REPORT IS A COMBINATION OF REPORTS P900419 AND P897293  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-110D060US927-FLLFLL  
Description: 4 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

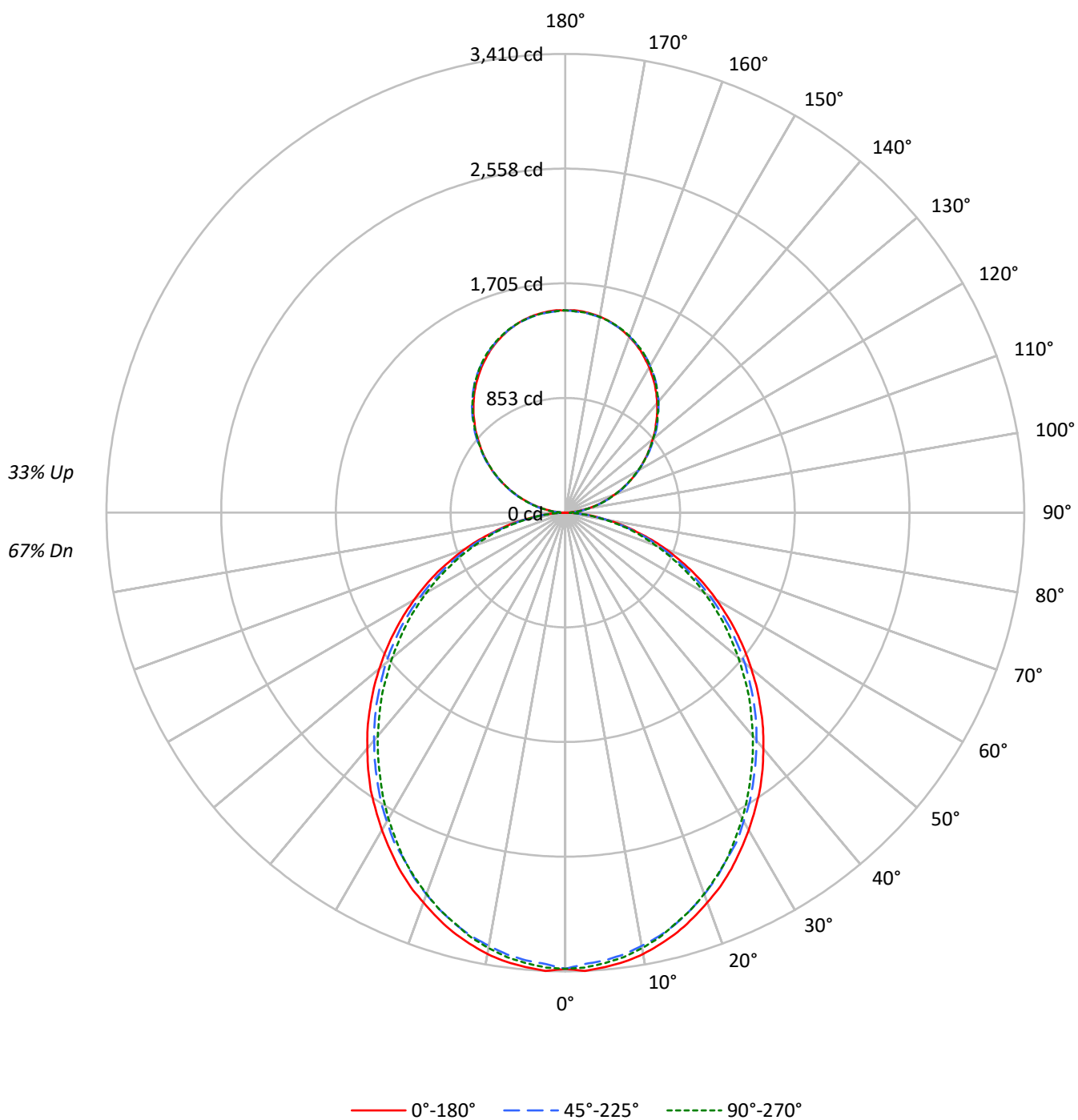
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 12833.3 lumens  
Efficiency: N/A  
Efficacy: 81.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: Semi-Direct  
  
Input Watts (W): 157.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9613  
Total Harmonic Distortion (THDi): 0.083  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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### Luminous Intensity Polar Plot



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

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2694 | 2694 | 2694 |
| 5°  | 2698 | 2656 | 2674 |
| 10° | 2676 | 2620 | 2638 |
| 15° | 2637 | 2577 | 2581 |
| 20° | 2584 | 2517 | 2523 |
| 25° | 2531 | 2446 | 2456 |
| 30° | 2464 | 2379 | 2371 |
| 35° | 2402 | 2300 | 2281 |
| 40° | 2324 | 2221 | 2195 |
| 45° | 2247 | 2141 | 2107 |
| 50° | 2163 | 2057 | 2005 |
| 55° | 2075 | 1960 | 1912 |
| 60° | 1975 | 1846 | 1805 |
| 65° | 1866 | 1727 | 1679 |
| 70° | 1728 | 1582 | 1543 |
| 75° | 1536 | 1408 | 1417 |
| 80° | 1305 | 1187 | 1177 |
| 85° | 945  | 806  | 781  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2247 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 319.1   | 2.5       |
| 10°-20°   | 897.9   | 7.0       |
| 20°-30°   | 1319.6  | 10.3      |
| 30°-40°   | 1532.6  | 11.9      |
| 40°-50°   | 1530.7  | 11.9      |
| 50°-60°   | 1334.7  | 10.4      |
| 60°-70°   | 986.7   | 7.7       |
| 70°-80°   | 558.2   | 4.3       |
| 80°-90°   | 151.6   | 1.2       |
| 90°-100°  | 93.0    | 0.7       |
| 100°-110° | 295.6   | 2.3       |
| 110°-120° | 505.8   | 3.9       |
| 120°-130° | 665.2   | 5.2       |
| 130°-140° | 746.6   | 5.8       |
| 140°-150° | 732.2   | 5.7       |
| 150°-160° | 614.2   | 4.8       |
| 160°-170° | 407.3   | 3.2       |
| 170°-180° | 142.4   | 1.1       |
| <hr/>     |         |           |
| 0°-30°    | 2536.6  | 19.8      |
| 0°-40°    | 4069.2  | 31.7      |
| 0°-60°    | 6934.6  | 54.0      |
| 0°-90°    | 8631.1  | 67.3      |
| 90°-120°  | 894.4   | 7.0       |
| 90°-150°  | 3038.4  | 23.7      |
| 90°-180°  | 4202.0  | 32.7      |
| 0°-180°   | 12833.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3391 | 3391  | 3391 | 3391  | 3391 |      |
| 5°   | 3391 | 3378  | 3342 | 3368  | 3362 | 322  |
| 15°  | 3228 | 3208  | 3166 | 3179  | 3163 | 909  |
| 25°  | 2921 | 2895  | 2840 | 2846  | 2840 | 1344 |
| 35°  | 2520 | 2488  | 2436 | 2416  | 2400 | 1574 |
| 45°  | 2051 | 2028  | 1979 | 1943  | 1930 | 1583 |
| 55°  | 1552 | 1532  | 1493 | 1454  | 1438 | 1388 |
| 65°  | 1047 | 1027  | 994  | 965   | 949  | 1035 |
| 75°  | 548  | 541   | 525  | 505   | 512  | 585  |
| 85°  | 134  | 130   | 127  | 117   | 114  | 149  |
| 90°  | 1    | 16    | 44   | 42    | 43   | 12   |
| 95°  | 66   | 79    | 81   | 81    | 79   | 74   |
| 105° | 273  | 276   | 279  | 282   | 282  | 288  |
| 115° | 508  | 515   | 512  | 511   | 508  | 502  |
| 125° | 738  | 750   | 746  | 742   | 740  | 660  |
| 135° | 955  | 969   | 972  | 970   | 967  | 738  |
| 145° | 1159 | 1168  | 1176 | 1177  | 1172 | 724  |
| 155° | 1326 | 1329  | 1333 | 1340  | 1336 | 610  |
| 165° | 1442 | 1441  | 1441 | 1450  | 1443 | 407  |
| 175° | 1500 | 1497  | 1494 | 1503  | 1496 | 143  |
| 180° | 1503 | 1503  | 1503 | 1503  | 1503 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3390.7 | 3390.7 | 3390.7 | 3390.7 | 3390.7 |
| 2.5°   | 3410.3 | 3394.1 | 3358.1 | 3390.7 | 3384.4 |
| 5°     | 3390.7 | 3377.9 | 3341.9 | 3367.8 | 3361.6 |
| 7.5°   | 3367.8 | 3348.5 | 3312.5 | 3338.8 | 3332.2 |
| 10°    | 3332.2 | 3309.3 | 3270.3 | 3296.2 | 3286.5 |
| 12.5°  | 3283.1 | 3263.7 | 3224.7 | 3240.9 | 3234.3 |
| 15°    | 3227.7 | 3208.3 | 3165.8 | 3178.9 | 3162.7 |
| 17.5°  | 3159.2 | 3139.9 | 3097.3 | 3113.6 | 3097.3 |
| 20°    | 3084.2 | 3064.8 | 3019.2 | 3028.8 | 3016.1 |
| 22.5°  | 3009.5 | 2980.0 | 2937.5 | 2937.5 | 2930.9 |
| 25°    | 2921.2 | 2895.3 | 2840.0 | 2846.2 | 2840.0 |
| 27.5°  | 2823.3 | 2800.5 | 2758.3 | 2748.6 | 2732.4 |
| 30°    | 2725.8 | 2699.5 | 2650.7 | 2641.1 | 2627.9 |
| 32.5°  | 2621.3 | 2602.0 | 2549.7 | 2530.0 | 2516.8 |
| 35°    | 2520.3 | 2487.8 | 2435.6 | 2415.8 | 2399.6 |
| 37.5°  | 2406.2 | 2376.8 | 2324.6 | 2301.7 | 2285.4 |
| 40°    | 2288.9 | 2262.6 | 2210.4 | 2181.4 | 2168.2 |
| 42.5°  | 2174.8 | 2148.5 | 2096.6 | 2063.7 | 2044.4 |
| 45°    | 2051.0 | 2028.1 | 1978.9 | 1943.4 | 1930.2 |
| 47.5°  | 1930.2 | 1907.4 | 1855.1 | 1819.2 | 1799.8 |
| 50°    | 1802.9 | 1786.7 | 1741.0 | 1695.3 | 1679.1 |
| 52.5°  | 1679.1 | 1656.2 | 1614.1 | 1578.0 | 1555.2 |
| 55°    | 1552.1 | 1532.4 | 1493.3 | 1454.2 | 1438.0 |
| 57.5°  | 1424.8 | 1408.6 | 1366.0 | 1326.9 | 1313.8 |
| 60°    | 1297.5 | 1284.8 | 1239.1 | 1203.1 | 1193.4 |
| 62.5°  | 1173.7 | 1150.9 | 1118.3 | 1085.8 | 1072.7 |
| 65°    | 1046.7 | 1027.0 | 994.5  | 965.1  | 948.9  |
| 67.5°  | 916.3  | 899.8  | 870.7  | 847.9  | 834.7  |
| 70°    | 795.6  | 782.4  | 753.0  | 730.2  | 717.4  |
| 72.5°  | 671.8  | 658.6  | 642.4  | 619.6  | 609.8  |
| 75°    | 547.6  | 541.4  | 524.7  | 505.4  | 512.0  |
| 77.5°  | 436.9  | 423.7  | 417.2  | 407.5  | 397.8  |
| 80°    | 326.2  | 322.7  | 316.2  | 306.5  | 299.9  |
| 82.5°  | 221.7  | 221.7  | 218.6  | 205.5  | 205.5  |
| 85°    | 133.6  | 130.4  | 127.3  | 117.2  | 114.2  |
| 87.5°  | 58.8   | 52.2   | 45.6   | 36.0   | 32.5   |
| 90°    | 1.3    | 16.3   | 44.4   | 41.7   | 43.0   |
| 92.5°  | 28.1   | 38.1   | 39.5   | 40.8   | 40.8   |
| 95°    | 66.1   | 78.8   | 81.1   | 81.1   | 78.8   |
| 97.5°  | 110.1  | 121.9  | 126.9  | 126.9  | 126.9  |
| 100°   | 160.9  | 171.3  | 174.9  | 174.9  | 173.6  |
| 102.5° | 214.4  | 222.0  | 227.0  | 228.4  | 227.0  |
| 105°   | 272.8  | 276.5  | 279.2  | 281.5  | 281.5  |
| 107.5° | 330.8  | 336.3  | 336.3  | 337.2  | 330.8  |
| 110°   | 387.1  | 394.3  | 394.3  | 394.3  | 390.6  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 447.7  | 455.4  | 454.1  | 450.4  | 447.7  |
| 115°   | 507.6  | 514.8  | 512.5  | 511.2  | 507.6  |
| 117.5° | 567.0  | 576.9  | 570.5  | 567.0  | 563.3  |
| 120°   | 626.8  | 636.8  | 626.8  | 626.8  | 622.7  |
| 122.5° | 681.1  | 693.8  | 687.5  | 683.9  | 681.1  |
| 125°   | 738.2  | 749.6  | 745.9  | 741.9  | 740.5  |
| 127.5° | 794.0  | 808.0  | 803.0  | 797.6  | 794.0  |
| 130°   | 846.1  | 862.4  | 860.2  | 857.5  | 852.5  |
| 132.5° | 904.6  | 917.3  | 918.1  | 911.8  | 908.2  |
| 135°   | 954.9  | 968.9  | 971.6  | 970.3  | 966.6  |
| 137.5° | 1011.1 | 1022.4 | 1024.7 | 1023.7 | 1018.3 |
| 140°   | 1060.5 | 1071.8 | 1078.2 | 1078.2 | 1073.2 |
| 142.5° | 1111.2 | 1122.5 | 1126.2 | 1127.5 | 1122.5 |
| 145°   | 1159.3 | 1168.3 | 1175.6 | 1176.9 | 1172.0 |
| 147.5° | 1202.3 | 1213.6 | 1219.1 | 1221.3 | 1216.3 |
| 150°   | 1246.7 | 1254.4 | 1259.4 | 1263.4 | 1259.4 |
| 152.5° | 1286.1 | 1293.9 | 1300.2 | 1305.2 | 1300.2 |
| 155°   | 1325.6 | 1329.2 | 1333.2 | 1339.7 | 1335.5 |
| 157.5° | 1359.5 | 1362.3 | 1364.5 | 1373.6 | 1367.3 |
| 160°   | 1390.0 | 1392.7 | 1394.0 | 1401.7 | 1396.3 |
| 162.5° | 1418.0 | 1418.0 | 1419.4 | 1428.0 | 1421.6 |
| 165°   | 1442.0 | 1440.7 | 1440.7 | 1449.8 | 1443.4 |
| 167.5° | 1463.8 | 1459.8 | 1459.8 | 1468.8 | 1462.4 |
| 170°   | 1480.1 | 1476.5 | 1475.1 | 1484.2 | 1476.5 |
| 172.5° | 1491.4 | 1487.8 | 1486.4 | 1495.5 | 1487.8 |
| 175°   | 1500.5 | 1496.9 | 1494.1 | 1503.2 | 1495.5 |
| 177.5° | 1505.5 | 1501.9 | 1499.1 | 1506.8 | 1499.1 |
| 180°   | 1503.2 | 1503.2 | 1503.2 | 1503.2 | 1503.2 |

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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 | 12.17            | 13.21 | 12.96 | 14.02 | 15.02 | 11.73          | 12.78 | 12.53 | 13.59 | 14.59 |
|                 | 3H   | 13.84            | 14.77 | 14.65 | 15.60 | 16.63 | 13.37          | 14.30 | 14.17 | 15.13 | 16.16 |
|                 | 4H   | 14.43            | 15.32 | 15.26 | 16.15 | 17.19 | 13.96          | 14.85 | 14.79 | 15.68 | 16.72 |
|                 | 6H   | 14.84            | 15.66 | 15.68 | 16.50 | 17.56 | 14.37          | 15.18 | 15.20 | 16.03 | 17.08 |
|                 | 8H   | 14.95            | 15.73 | 15.80 | 16.59 | 17.65 | 14.48          | 15.26 | 15.32 | 16.12 | 17.17 |
|                 | 12H  | 15.01            | 15.75 | 15.86 | 16.60 | 17.68 | 14.53          | 15.27 | 15.38 | 16.12 | 17.20 |
| 4H              | 2H   | 12.65            | 13.53 | 13.48 | 14.37 | 15.41 | 12.30          | 13.19 | 13.13 | 14.02 | 15.06 |
|                 | 3H   | 14.53            | 15.27 | 15.37 | 16.14 | 17.19 | 14.14          | 14.88 | 14.98 | 15.74 | 16.80 |
|                 | 4H   | 15.25            | 15.92 | 16.11 | 16.79 | 17.87 | 14.85          | 15.52 | 15.70 | 16.38 | 17.47 |
|                 | 6H   | 15.78            | 16.36 | 16.65 | 17.25 | 18.34 | 15.37          | 15.95 | 16.24 | 16.84 | 17.93 |
|                 | 8H   | 15.93            | 16.47 | 16.80 | 17.36 | 18.46 | 15.52          | 16.06 | 16.39 | 16.95 | 18.05 |
|                 | 12H  | 16.01            | 16.50 | 16.90 | 17.41 | 18.51 | 15.59          | 16.08 | 16.48 | 16.98 | 18.09 |
| 8H              | 4H   | 15.46            | 16.01 | 16.34 | 16.89 | 17.99 | 15.10          | 15.65 | 15.98 | 16.53 | 17.63 |
|                 | 6H   | 16.10            | 16.55 | 17.00 | 17.48 | 18.58 | 15.74          | 16.19 | 16.64 | 17.12 | 18.22 |
|                 | 8H   | 16.32            | 16.72 | 17.23 | 17.64 | 18.76 | 15.96          | 16.36 | 16.87 | 17.27 | 18.39 |
|                 | 12H  | 16.46            | 16.82 | 17.38 | 17.73 | 18.90 | 16.08          | 16.43 | 16.99 | 17.34 | 18.51 |
| 12H             | 4H   | 15.46            | 15.95 | 16.35 | 16.85 | 17.96 | 15.11          | 15.60 | 16.00 | 16.50 | 17.61 |
|                 | 6H   | 16.13            | 16.53 | 17.04 | 17.45 | 18.57 | 15.78          | 16.18 | 16.69 | 17.10 | 18.22 |
|                 | 8H   | 16.38            | 16.74 | 17.30 | 17.65 | 18.82 | 16.03          | 16.38 | 16.94 | 17.29 | 18.46 |