

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: P919807

Luminaire Tested: DFN2DIP-PN4F0-120D050US935-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P919807  
REPORT IS A COMBINATION OF REPORTS P901164 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-120D050US935-RLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

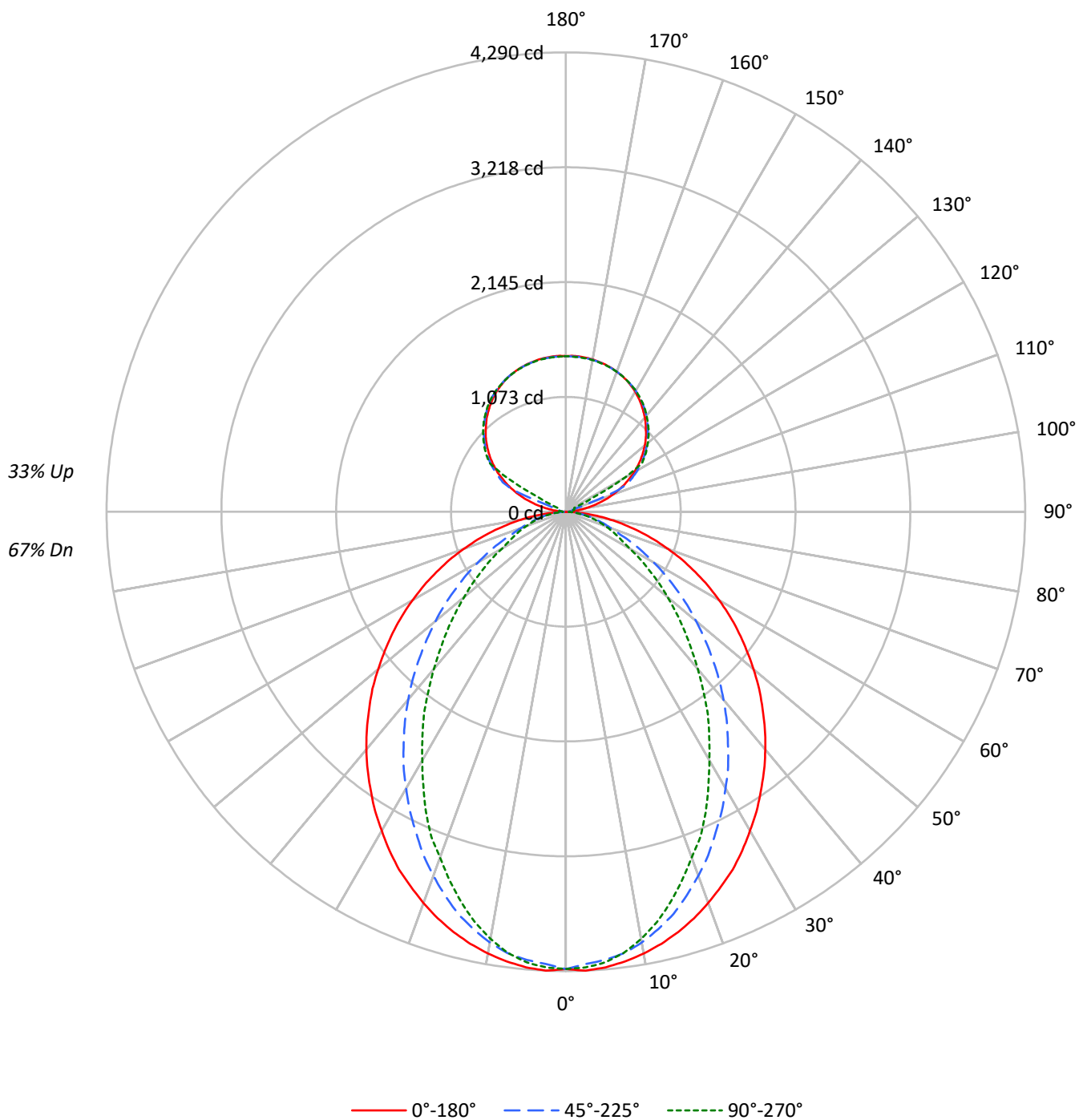
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 13044.1 lumens  
Efficiency: N/A  
Efficacy: 79.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Direct  
  
Input Watts (W): 163.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9781  
Total Harmonic Distortion (THDi): 0.075  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P919807

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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 | 30 | 10 |
| RCR |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |
| 0   | 111 | 111 | 111 | 111 | 105 | 105 | 105 | 105 | 93 | 93 | 93 | 82 | 82 | 82 | 72 | 72 | 72 |
| 1   | 102 | 98  | 94  | 91  | 96  | 93  | 89  | 86  | 83 | 80 | 78 | 73 | 71 | 70 | 65 | 63 | 62 |
| 2   | 94  | 86  | 80  | 75  | 88  | 82  | 77  | 72  | 73 | 69 | 66 | 65 | 62 | 59 | 58 | 55 | 53 |
| 3   | 86  | 77  | 69  | 64  | 81  | 73  | 66  | 61  | 65 | 60 | 56 | 58 | 54 | 51 | 52 | 49 | 46 |
| 4   | 79  | 68  | 61  | 55  | 74  | 65  | 58  | 52  | 58 | 53 | 48 | 52 | 48 | 44 | 47 | 43 | 40 |
| 5   | 73  | 61  | 53  | 47  | 69  | 58  | 51  | 46  | 53 | 47 | 42 | 47 | 43 | 39 | 42 | 39 | 36 |
| 6   | 67  | 55  | 47  | 42  | 63  | 53  | 45  | 40  | 48 | 42 | 37 | 43 | 38 | 34 | 39 | 35 | 32 |
| 7   | 63  | 50  | 42  | 37  | 59  | 48  | 41  | 36  | 44 | 38 | 33 | 39 | 35 | 31 | 36 | 32 | 28 |
| 8   | 58  | 46  | 38  | 33  | 55  | 44  | 37  | 32  | 40 | 34 | 30 | 36 | 31 | 28 | 33 | 29 | 26 |
| 9   | 54  | 42  | 35  | 30  | 51  | 40  | 33  | 29  | 37 | 31 | 27 | 34 | 29 | 25 | 30 | 26 | 23 |
| 10  | 51  | 39  | 32  | 27  | 48  | 37  | 31  | 26  | 34 | 28 | 25 | 31 | 26 | 23 | 28 | 24 | 21 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3117 | 3117 | 3117 |
| 5°  | 3122 | 3068 | 3088 |
| 10° | 3091 | 3008 | 2988 |
| 15° | 3049 | 2909 | 2833 |
| 20° | 2992 | 2773 | 2643 |
| 25° | 2935 | 2619 | 2459 |
| 30° | 2857 | 2462 | 2226 |
| 35° | 2781 | 2293 | 2021 |
| 40° | 2704 | 2118 | 1786 |
| 45° | 2614 | 1924 | 1573 |
| 50° | 2522 | 1728 | 1366 |
| 55° | 2425 | 1518 | 1166 |
| 60° | 2313 | 1299 | 960  |
| 65° | 2184 | 1076 | 865  |
| 70° | 2028 | 868  | 783  |
| 75° | 1831 | 767  | 714  |
| 80° | 1547 | 644  | 621  |
| 85° | 1078 | 433  | 471  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 2614 cd/sqm

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CATALOG NUMBER: DFN2DIP-PN4F0-120D050US935-RLLONL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 400.2   | 3.1       |
| 10°-20°   | 1098.7  | 8.4       |
| 20°-30°   | 1542.5  | 11.8      |
| 30°-40°   | 1681.4  | 12.9      |
| 40°-50°   | 1545.4  | 11.8      |
| 50°-60°   | 1213.7  | 9.3       |
| 60°-70°   | 790.0   | 6.1       |
| 70°-80°   | 406.7   | 3.1       |
| 80°-90°   | 106.4   | 0.8       |
| 90°-100°  | 47.9    | 0.4       |
| 100°-110° | 178.6   | 1.4       |
| 110°-120° | 473.7   | 3.6       |
| 120°-130° | 785.6   | 6.0       |
| 130°-140° | 834.5   | 6.4       |
| 140°-150° | 775.6   | 5.9       |
| 150°-160° | 623.5   | 4.8       |
| 160°-170° | 401.8   | 3.1       |
| 170°-180° | 138.3   | 1.1       |
| 0°-30°    | 3041.3  | 23.3      |
| 0°-40°    | 4722.7  | 36.2      |
| 0°-60°    | 7481.7  | 57.4      |
| 0°-90°    | 8784.7  | 67.3      |
| 90°-120°  | 700.2   | 5.4       |
| 90°-150°  | 3095.8  | 23.7      |
| 90°-180°  | 4259.0  | 32.7      |
| 0°-180°   | 13044.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4270 | 4270  | 4270 | 4270  | 4270 |      |
| 5°   | 4270 | 4251  | 4200 | 4235  | 4224 | 405  |
| 15°  | 4062 | 4019  | 3888 | 3814  | 3776 | 1144 |
| 25°  | 3687 | 3563  | 3308 | 3150  | 3091 | 1696 |
| 35°  | 3177 | 2980  | 2640 | 2396  | 2311 | 1988 |
| 45°  | 2597 | 2338  | 1932 | 1658  | 1565 | 2006 |
| 55°  | 1975 | 1673  | 1256 | 1024  | 951  | 1764 |
| 65°  | 1333 | 1020  | 672  | 541   | 529  | 1322 |
| 75°  | 711  | 440   | 309  | 282   | 278  | 752  |
| 85°  | 166  | 85    | 73   | 73    | 73   | 191  |
| 90°  | 1    | 13    | 21   | 26    | 28   | 12   |
| 95°  | 68   | 34    | 41   | 46    | 45   | 81   |
| 105° | 320  | 351   | 64   | 76    | 80   | 342  |
| 115° | 604  | 622   | 649  | 162   | 86   | 595  |
| 125° | 855  | 868   | 888  | 896   | 899  | 762  |
| 135° | 1058 | 1074  | 1084 | 1094  | 1092 | 817  |
| 145° | 1227 | 1226  | 1244 | 1251  | 1246 | 767  |
| 155° | 1351 | 1342  | 1354 | 1360  | 1352 | 622  |
| 165° | 1423 | 1417  | 1420 | 1428  | 1420 | 402  |
| 175° | 1456 | 1449  | 1451 | 1458  | 1448 | 139  |
| 180° | 1453 | 1453  | 1453 | 1453  | 1453 |      |

TEST NUMBER: P919807

CATALOG NUMBER: DFN2DIP-PN4F0-120D050US935-RLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4270.2 | 4270.2 | 4270.2 | 4270.2 | 4270.2 |
| 2.5°   | 4289.5 | 4270.2 | 4227.6 | 4266.5 | 4258.7 |
| 5°     | 4270.2 | 4250.9 | 4200.5 | 4235.3 | 4223.9 |
| 7.5°   | 4235.3 | 4212.3 | 4158.3 | 4173.4 | 4154.1 |
| 10°    | 4189.0 | 4162.0 | 4084.8 | 4073.0 | 4050.0 |
| 12.5°  | 4131.2 | 4096.4 | 3991.8 | 3968.9 | 3926.2 |
| 15°    | 4061.5 | 4018.9 | 3887.7 | 3814.2 | 3775.7 |
| 17.5°  | 3980.3 | 3918.4 | 3756.0 | 3671.2 | 3609.3 |
| 20°    | 3887.7 | 3810.2 | 3617.1 | 3520.7 | 3435.4 |
| 22.5°  | 3787.2 | 3698.2 | 3474.0 | 3342.7 | 3285.0 |
| 25°    | 3686.8 | 3562.9 | 3307.9 | 3149.6 | 3091.4 |
| 27.5°  | 3567.0 | 3435.4 | 3153.3 | 2971.7 | 2882.7 |
| 30°    | 3439.5 | 3292.4 | 2983.2 | 2786.4 | 2681.8 |
| 32.5°  | 3315.7 | 3137.7 | 2821.2 | 2589.2 | 2492.4 |
| 35°    | 3176.7 | 2979.5 | 2639.6 | 2396.1 | 2310.7 |
| 37.5°  | 3041.4 | 2828.6 | 2469.4 | 2202.5 | 2106.2 |
| 40°    | 2898.3 | 2666.7 | 2291.5 | 2017.2 | 1916.8 |
| 42.5°  | 2751.5 | 2504.3 | 2114.0 | 1827.8 | 1731.5 |
| 45°    | 2596.9 | 2337.9 | 1932.3 | 1657.7 | 1564.9 |
| 47.5°  | 2450.1 | 2175.9 | 1758.5 | 1483.8 | 1398.9 |
| 50°    | 2287.8 | 2013.5 | 1588.4 | 1321.5 | 1240.7 |
| 52.5°  | 2129.2 | 1839.3 | 1426.0 | 1171.0 | 1097.6 |
| 55°    | 1974.6 | 1673.3 | 1255.9 | 1024.2 | 950.8  |
| 57.5°  | 1816.3 | 1507.2 | 1105.3 | 888.9  | 827.0  |
| 60°    | 1654.0 | 1344.8 | 946.7  | 749.9  | 688.0  |
| 62.5°  | 1495.7 | 1186.5 | 811.4  | 626.1  | 595.3  |
| 65°    | 1333.3 | 1020.1 | 672.4  | 541.2  | 529.3  |
| 67.5°  | 1178.8 | 865.5  | 541.2  | 475.2  | 463.7  |
| 70°    | 1016.4 | 715.1  | 448.1  | 409.6  | 394.0  |
| 72.5°  | 861.9  | 575.7  | 374.7  | 344.0  | 336.2  |
| 75°    | 710.9  | 440.3  | 309.2  | 282.1  | 278.4  |
| 77.5°  | 560.5  | 312.8  | 243.6  | 228.0  | 220.2  |
| 80°    | 421.1  | 224.3  | 185.3  | 170.1  | 170.1  |
| 82.5°  | 293.6  | 150.8  | 127.5  | 119.7  | 119.7  |
| 85°    | 166.1  | 84.9   | 73.4   | 73.4   | 73.4   |
| 87.5°  | 61.9   | 30.7   | 30.7   | 27.0   | 27.0   |
| 90°    | 1.0    | 12.6   | 21.0   | 26.3   | 28.3   |
| 92.5°  | 26.3   | 22.1   | 25.2   | 27.4   | 28.3   |
| 95°    | 68.3   | 33.6   | 41.0   | 46.3   | 45.2   |
| 97.5°  | 123.0  | 36.9   | 53.6   | 56.8   | 57.8   |
| 100°   | 186.1  | 42.1   | 59.9   | 68.3   | 70.4   |
| 102.5° | 255.5  | 253.4  | 62.1   | 73.5   | 76.8   |
| 105°   | 319.6  | 351.2  | 64.1   | 75.7   | 79.9   |
| 107.5° | 394.3  | 420.4  | 66.3   | 77.7   | 82.1   |
| 110°   | 465.8  | 487.8  | 184.0  | 78.9   | 83.0   |



TEST NUMBER: P919807

CATALOG NUMBER: DFN2DIP-PN4F0-120D050US935-RLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 533.0  | 551.9  | 534.1  | 80.9   | 84.1   |
| 115°   | 604.5  | 622.3  | 648.7  | 162.0  | 86.3   |
| 117.5° | 666.5  | 687.5  | 705.5  | 555.0  | 279.7  |
| 120°   | 735.9  | 751.7  | 770.6  | 783.2  | 641.3  |
| 122.5° | 794.7  | 811.6  | 832.7  | 839.0  | 840.1  |
| 125°   | 854.6  | 868.4  | 888.4  | 895.7  | 898.9  |
| 127.5° | 909.3  | 924.0  | 940.0  | 950.4  | 951.4  |
| 130°   | 960.9  | 977.7  | 989.2  | 1000.8 | 999.9  |
| 132.5° | 1013.5 | 1027.2 | 1038.6 | 1048.2 | 1047.1 |
| 135°   | 1057.6 | 1074.5 | 1083.8 | 1094.5 | 1092.3 |
| 137.5° | 1103.8 | 1116.5 | 1127.0 | 1137.6 | 1134.5 |
| 140°   | 1149.0 | 1157.5 | 1169.0 | 1178.4 | 1173.3 |
| 142.5° | 1187.0 | 1194.4 | 1208.0 | 1216.3 | 1211.1 |
| 145°   | 1226.9 | 1225.8 | 1243.6 | 1251.0 | 1245.8 |
| 147.5° | 1261.5 | 1258.3 | 1276.3 | 1281.5 | 1277.4 |
| 150°   | 1295.2 | 1287.9 | 1304.7 | 1311.0 | 1305.7 |
| 152.5° | 1323.5 | 1315.2 | 1330.9 | 1337.3 | 1329.9 |
| 155°   | 1350.9 | 1341.5 | 1354.1 | 1360.4 | 1352.0 |
| 157.5° | 1372.9 | 1364.6 | 1374.1 | 1381.5 | 1372.9 |
| 160°   | 1392.0 | 1385.6 | 1392.0 | 1398.2 | 1390.9 |
| 162.5° | 1408.7 | 1402.5 | 1407.6 | 1415.0 | 1405.6 |
| 165°   | 1423.4 | 1417.2 | 1420.3 | 1427.6 | 1420.3 |
| 167.5° | 1435.0 | 1428.7 | 1431.9 | 1439.2 | 1429.8 |
| 170°   | 1444.5 | 1438.1 | 1440.3 | 1447.6 | 1438.1 |
| 172.5° | 1450.8 | 1444.5 | 1446.6 | 1454.0 | 1444.5 |
| 175°   | 1456.0 | 1448.6 | 1450.8 | 1458.1 | 1447.6 |
| 177.5° | 1458.1 | 1450.8 | 1451.9 | 1459.2 | 1449.7 |
| 180°   | 1452.8 | 1452.8 | 1452.8 | 1452.8 | 1452.8 |

TEST NUMBER: P919807

CATALOG NUMBER: DFN2DIP-PN4F0-120D050US935-RLONL

**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 | 12.59            | 13.58 | 13.39 | 14.40 | 15.40 | 8.55           | 9.55  | 9.35  | 10.37 | 11.37 |
|                 | 3H   | 14.28            | 15.17 | 15.09 | 16.00 | 17.03 | 9.76           | 10.65 | 10.57 | 11.47 | 12.50 |
|                 | 4H   | 14.90            | 15.74 | 15.73 | 16.57 | 17.62 | 10.21          | 11.05 | 11.04 | 11.89 | 12.93 |
|                 | 6H   | 15.33            | 16.10 | 16.17 | 16.95 | 18.00 | 10.54          | 11.32 | 11.39 | 12.16 | 13.22 |
|                 | 8H   | 15.46            | 16.20 | 16.32 | 17.06 | 18.12 | 10.64          | 11.37 | 11.49 | 12.24 | 13.29 |
|                 | 12H  | 15.53            | 16.23 | 16.39 | 17.09 | 18.17 | 10.69          | 11.39 | 11.55 | 12.24 | 13.32 |
| 4H              | 2H   | 12.63            | 13.47 | 13.46 | 14.30 | 15.34 | 9.17           | 10.01 | 10.01 | 10.84 | 11.89 |
|                 | 3H   | 14.47            | 15.17 | 15.32 | 16.04 | 17.10 | 10.54          | 11.23 | 11.38 | 12.10 | 13.16 |
|                 | 4H   | 15.17            | 15.81 | 16.03 | 16.67 | 17.76 | 11.09          | 11.72 | 11.95 | 12.59 | 13.68 |
|                 | 6H   | 15.70            | 16.25 | 16.58 | 17.14 | 18.23 | 11.52          | 12.07 | 12.40 | 12.96 | 14.05 |
|                 | 8H   | 15.88            | 16.39 | 16.76 | 17.28 | 18.38 | 11.65          | 12.16 | 12.53 | 13.05 | 14.15 |
|                 | 12H  | 15.99            | 16.44 | 16.88 | 17.35 | 18.46 | 11.73          | 12.18 | 12.62 | 13.09 | 14.20 |
| 8H              | 4H   | 15.15            | 15.66 | 16.03 | 16.55 | 17.65 | 11.39          | 11.90 | 12.26 | 12.78 | 13.88 |
|                 | 6H   | 15.73            | 16.15 | 16.63 | 17.08 | 18.18 | 11.91          | 12.33 | 12.82 | 13.26 | 14.36 |
|                 | 8H   | 15.95            | 16.32 | 16.86 | 17.24 | 18.36 | 12.10          | 12.48 | 13.02 | 13.40 | 14.52 |
|                 | 12H  | 16.10            | 16.43 | 17.01 | 17.34 | 18.51 | 12.23          | 12.56 | 13.15 | 13.47 | 14.64 |
| 12H             | 4H   | 15.11            | 15.57 | 16.01 | 16.48 | 17.58 | 11.40          | 11.86 | 12.29 | 12.76 | 13.87 |
|                 | 6H   | 15.71            | 16.08 | 16.62 | 17.00 | 18.12 | 11.96          | 12.34 | 12.88 | 13.26 | 14.37 |
|                 | 8H   | 15.94            | 16.26 | 16.85 | 17.18 | 18.35 | 12.18          | 12.51 | 13.10 | 13.42 | 14.59 |