

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: P917083

Luminaire Tested: DFN2DIP-PN4F0-120D060US930-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P917083  
REPORT IS A COMBINATION OF REPORTS P901182 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-120D060US930-RLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

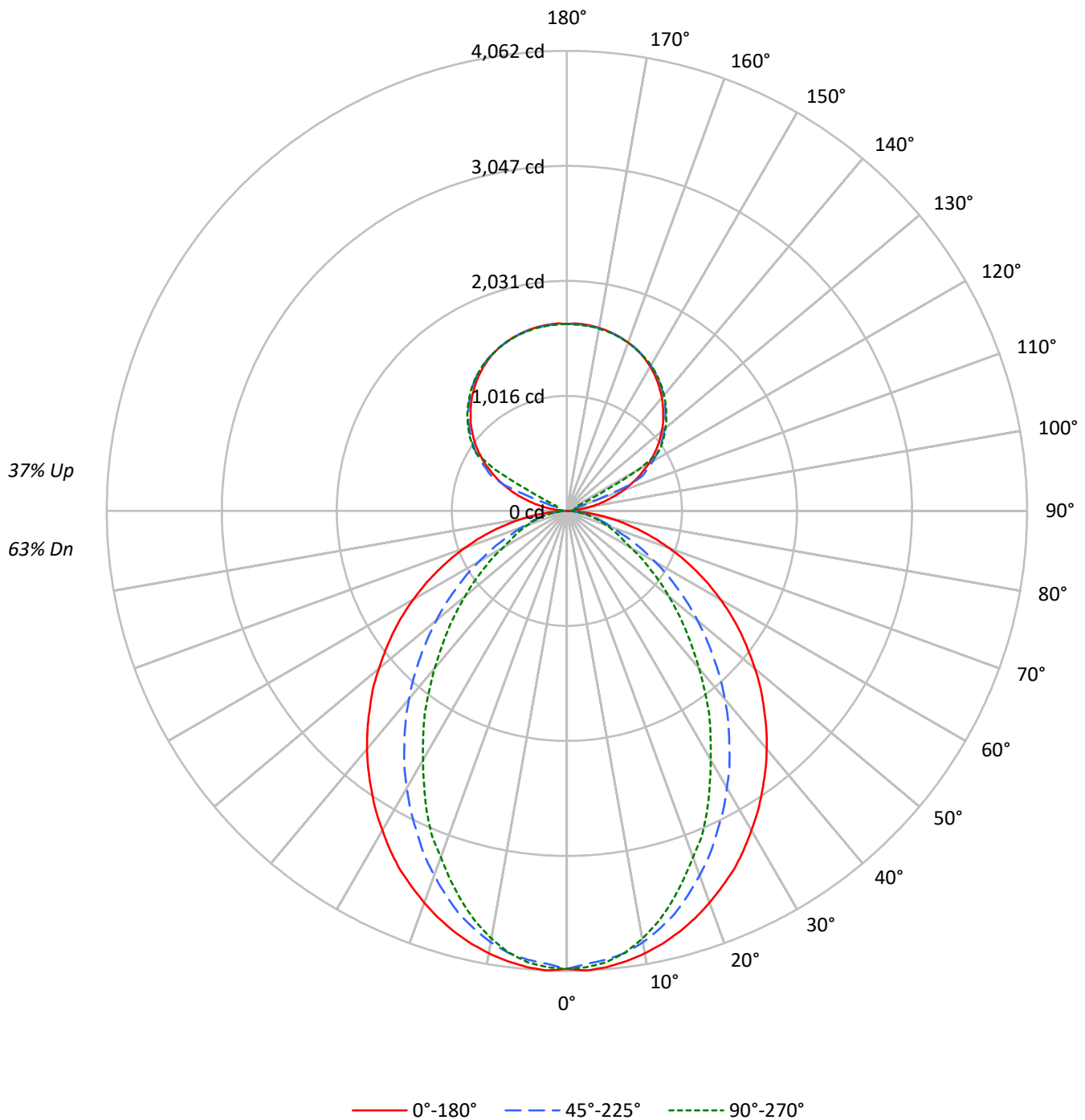
Lumens per Lamp: N/A  
Luminaire Lumens: 13158.9 lumens  
Efficiency: N/A  
Efficacy: 76.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 171.4  
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: P917083

CATALOG NUMBER: DFN2DIP-PN4F0-120D060US930-RLLONL

### Luminous Intensity Polar Plot



TEST NUMBER: P917083

CATALOG NUMBER: DFN2DIP-PN4F0-120D060US930-RLLONL

**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   | 110 | 110 | 110 | 110 | 103 | 103 | 103 | 103 | 91 | 91 | 91 | 79 | 79 | 79 | 68 | 68 | 68 |
| 1   | 101 | 97  | 93  | 90  | 95  | 91  | 88  | 85  | 80 | 78 | 76 | 71 | 69 | 67 | 61 | 60 | 59 |
| 2   | 93  | 86  | 80  | 75  | 87  | 81  | 75  | 71  | 71 | 67 | 64 | 63 | 60 | 57 | 55 | 52 | 51 |
| 3   | 85  | 76  | 69  | 63  | 80  | 72  | 65  | 60  | 63 | 58 | 54 | 56 | 52 | 49 | 49 | 46 | 44 |
| 4   | 78  | 68  | 60  | 54  | 73  | 64  | 57  | 52  | 57 | 51 | 47 | 50 | 46 | 43 | 44 | 41 | 38 |
| 5   | 72  | 61  | 53  | 47  | 67  | 57  | 50  | 45  | 51 | 45 | 41 | 46 | 41 | 37 | 40 | 37 | 34 |
| 6   | 67  | 55  | 47  | 41  | 62  | 52  | 45  | 39  | 46 | 41 | 36 | 41 | 37 | 33 | 37 | 33 | 30 |
| 7   | 62  | 50  | 42  | 36  | 58  | 47  | 40  | 35  | 42 | 36 | 32 | 38 | 33 | 30 | 34 | 30 | 27 |
| 8   | 58  | 45  | 38  | 32  | 54  | 43  | 36  | 31  | 39 | 33 | 29 | 35 | 30 | 27 | 31 | 27 | 24 |
| 9   | 54  | 42  | 34  | 29  | 51  | 40  | 33  | 28  | 36 | 30 | 26 | 32 | 27 | 24 | 29 | 25 | 22 |
| 10  | 50  | 38  | 31  | 26  | 47  | 37  | 30  | 25  | 33 | 28 | 24 | 30 | 25 | 22 | 27 | 23 | 20 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2952 | 2952 | 2952 |
| 5°  | 2956 | 2905 | 2924 |
| 10° | 2927 | 2849 | 2829 |
| 15° | 2887 | 2755 | 2683 |
| 20° | 2833 | 2625 | 2503 |
| 25° | 2779 | 2480 | 2329 |
| 30° | 2706 | 2331 | 2108 |
| 35° | 2634 | 2171 | 1914 |
| 40° | 2561 | 2006 | 1692 |
| 45° | 2476 | 1822 | 1490 |
| 50° | 2388 | 1636 | 1293 |
| 55° | 2296 | 1438 | 1104 |
| 60° | 2190 | 1230 | 909  |
| 65° | 2068 | 1019 | 819  |
| 70° | 1920 | 823  | 742  |
| 75° | 1734 | 726  | 676  |
| 80° | 1465 | 610  | 588  |
| 85° | 1021 | 410  | 446  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2476 cd/sqm

TEST NUMBER: P917083

CATALOG NUMBER: DFN2DIP-PN4F0-120D060US930-RLLONL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 379.0   | 2.9       |
| 10°-20°   | 1040.3  | 7.9       |
| 20°-30°   | 1460.6  | 11.1      |
| 30°-40°   | 1592.1  | 12.1      |
| 40°-50°   | 1463.4  | 11.1      |
| 50°-60°   | 1149.2  | 8.7       |
| 60°-70°   | 748.0   | 5.7       |
| 70°-80°   | 385.1   | 2.9       |
| 80°-90°   | 101.2   | 0.8       |
| 90°-100°  | 54.4    | 0.4       |
| 100°-110° | 202.9   | 1.5       |
| 110°-120° | 538.2   | 4.1       |
| 120°-130° | 892.7   | 6.8       |
| 130°-140° | 948.2   | 7.2       |
| 140°-150° | 881.3   | 6.7       |
| 150°-160° | 708.5   | 5.4       |
| 160°-170° | 456.5   | 3.5       |
| 170°-180° | 157.1   | 1.2       |
| 0°-30°    | 2879.9  | 21.9      |
| 0°-40°    | 4472.0  | 34.0      |
| 0°-60°    | 7084.6  | 53.8      |
| 0°-90°    | 8318.9  | 63.2      |
| 90°-120°  | 795.6   | 6.0       |
| 90°-150°  | 3517.8  | 26.7      |
| 90°-180°  | 4840.0  | 36.8      |
| 0°-180°   | 13158.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4044 | 4044  | 4044 | 4044  | 4044 |      |
| 5°   | 4044 | 4025  | 3978 | 4010  | 4000 | 383  |
| 15°  | 3846 | 3806  | 3681 | 3612  | 3575 | 1084 |
| 25°  | 3491 | 3374  | 3132 | 2982  | 2927 | 1606 |
| 35°  | 3008 | 2821  | 2500 | 2269  | 2188 | 1883 |
| 45°  | 2459 | 2214  | 1830 | 1570  | 1482 | 1899 |
| 55°  | 1870 | 1584  | 1189 | 970   | 900  | 1671 |
| 65°  | 1263 | 966   | 637  | 512   | 501  | 1252 |
| 75°  | 673  | 417   | 293  | 267   | 264  | 712  |
| 85°  | 157  | 80    | 70   | 70    | 70   | 181  |
| 90°  | 1    | 14    | 24   | 30    | 32   | 12   |
| 95°  | 78   | 38    | 47   | 53    | 51   | 92   |
| 105° | 363  | 399   | 73   | 86    | 91   | 388  |
| 115° | 687  | 707   | 737  | 184   | 98   | 676  |
| 125° | 971  | 987   | 1009 | 1018  | 1021 | 866  |
| 135° | 1202 | 1221  | 1232 | 1244  | 1241 | 928  |
| 145° | 1394 | 1393  | 1413 | 1422  | 1416 | 872  |
| 155° | 1535 | 1524  | 1539 | 1546  | 1536 | 707  |
| 165° | 1618 | 1610  | 1614 | 1622  | 1614 | 457  |
| 175° | 1654 | 1646  | 1648 | 1657  | 1645 | 157  |
| 180° | 1651 | 1651  | 1651 | 1651  | 1651 |      |

TEST NUMBER: P917083

CATALOG NUMBER: DFN2DIP-PN4F0-120D060US930-RLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4043.6 | 4043.6 | 4043.6 | 4043.6 | 4043.6 |
| 2.5°   | 4061.8 | 4043.6 | 4003.2 | 4040.0 | 4032.6 |
| 5°     | 4043.6 | 4025.3 | 3977.5 | 4010.5 | 3999.7 |
| 7.5°   | 4010.5 | 3988.8 | 3937.6 | 3951.9 | 3933.7 |
| 10°    | 3966.7 | 3941.1 | 3868.0 | 3856.8 | 3835.1 |
| 12.5°  | 3911.9 | 3878.9 | 3779.9 | 3758.2 | 3717.8 |
| 15°    | 3845.9 | 3805.6 | 3681.3 | 3611.8 | 3575.3 |
| 17.5°  | 3769.0 | 3710.4 | 3556.7 | 3476.4 | 3417.7 |
| 20°    | 3681.3 | 3607.9 | 3425.1 | 3333.8 | 3253.0 |
| 22.5°  | 3586.2 | 3502.0 | 3289.6 | 3165.3 | 3110.6 |
| 25°    | 3491.1 | 3373.8 | 3132.3 | 2982.4 | 2927.3 |
| 27.5°  | 3377.7 | 3253.0 | 2985.9 | 2814.0 | 2729.7 |
| 30°    | 3257.0 | 3117.6 | 2824.8 | 2638.5 | 2539.5 |
| 32.5°  | 3139.7 | 2971.2 | 2671.5 | 2451.8 | 2360.1 |
| 35°    | 3008.1 | 2821.3 | 2499.5 | 2268.9 | 2188.1 |
| 37.5°  | 2880.0 | 2678.5 | 2338.4 | 2085.6 | 1994.4 |
| 40°    | 2744.5 | 2525.1 | 2169.9 | 1910.2 | 1815.0 |
| 42.5°  | 2605.4 | 2371.4 | 2001.8 | 1730.8 | 1639.6 |
| 45°    | 2459.1 | 2213.8 | 1829.8 | 1569.7 | 1481.9 |
| 47.5°  | 2320.1 | 2060.4 | 1665.2 | 1405.1 | 1324.7 |
| 50°    | 2166.4 | 1906.7 | 1504.1 | 1251.3 | 1174.8 |
| 52.5°  | 2016.2 | 1741.6 | 1350.3 | 1108.8 | 1039.3 |
| 55°    | 1869.8 | 1584.5 | 1189.2 | 969.8  | 900.3  |
| 57.5°  | 1719.9 | 1427.2 | 1046.7 | 841.7  | 783.1  |
| 60°    | 1566.2 | 1273.4 | 896.4  | 710.1  | 651.5  |
| 62.5°  | 1416.3 | 1123.6 | 768.3  | 592.9  | 563.7  |
| 65°    | 1262.6 | 966.0  | 636.7  | 512.5  | 501.2  |
| 67.5°  | 1116.2 | 819.5  | 512.5  | 450.0  | 439.1  |
| 70°    | 962.5  | 677.1  | 424.4  | 387.8  | 373.1  |
| 72.5°  | 816.1  | 545.1  | 354.8  | 325.7  | 318.4  |
| 75°    | 673.2  | 416.9  | 292.8  | 267.1  | 263.6  |
| 77.5°  | 530.8  | 296.2  | 230.6  | 215.9  | 208.5  |
| 80°    | 398.8  | 212.4  | 175.5  | 161.1  | 161.1  |
| 82.5°  | 278.0  | 142.8  | 120.7  | 113.3  | 113.3  |
| 85°    | 157.3  | 80.4   | 69.5   | 69.5   | 69.5   |
| 87.5°  | 58.6   | 29.1   | 29.1   | 25.6   | 25.6   |
| 90°    | 1.1    | 14.3   | 23.8   | 29.9   | 32.2   |
| 92.5°  | 29.9   | 25.1   | 28.6   | 31.1   | 32.2   |
| 95°    | 77.6   | 38.2   | 46.6   | 52.7   | 51.4   |
| 97.5°  | 139.7  | 41.8   | 60.8   | 64.6   | 65.7   |
| 100°   | 211.5  | 47.8   | 68.1   | 77.6   | 80.0   |
| 102.5° | 290.2  | 288.0  | 70.5   | 83.6   | 87.2   |
| 105°   | 363.1  | 399.0  | 72.9   | 85.9   | 90.8   |
| 107.5° | 448.0  | 477.8  | 75.3   | 88.4   | 93.2   |
| 110°   | 529.3  | 554.2  | 209.1  | 89.7   | 94.3   |

TEST NUMBER: P917083

CATALOG NUMBER: DFN2DIP-PN4F0-120D060US930-RLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 605.7  | 627.1  | 606.8  | 91.9   | 95.6   |
| 115°   | 686.9  | 707.2  | 737.1  | 184.0  | 98.0   |
| 117.5° | 757.3  | 781.2  | 801.6  | 630.7  | 317.7  |
| 120°   | 836.3  | 854.1  | 875.7  | 890.0  | 728.7  |
| 122.5° | 903.0  | 922.2  | 946.2  | 953.2  | 954.6  |
| 125°   | 971.2  | 986.8  | 1009.4 | 1017.8 | 1021.3 |
| 127.5° | 1033.3 | 1050.0 | 1068.0 | 1079.9 | 1081.1 |
| 130°   | 1091.8 | 1111.0 | 1124.1 | 1137.3 | 1136.1 |
| 132.5° | 1151.6 | 1167.2 | 1180.2 | 1191.0 | 1189.8 |
| 135°   | 1201.8 | 1221.0 | 1231.6 | 1243.7 | 1241.2 |
| 137.5° | 1254.3 | 1268.6 | 1280.7 | 1292.6 | 1289.1 |
| 140°   | 1305.6 | 1315.3 | 1328.4 | 1339.1 | 1333.2 |
| 142.5° | 1348.7 | 1357.1 | 1372.6 | 1382.1 | 1376.1 |
| 145°   | 1394.2 | 1392.9 | 1413.2 | 1421.6 | 1415.6 |
| 147.5° | 1433.5 | 1429.9 | 1450.2 | 1456.1 | 1451.5 |
| 150°   | 1471.8 | 1463.4 | 1482.5 | 1489.6 | 1483.7 |
| 152.5° | 1504.0 | 1494.4 | 1512.3 | 1519.6 | 1511.2 |
| 155°   | 1535.0 | 1524.4 | 1538.7 | 1545.8 | 1536.3 |
| 157.5° | 1560.2 | 1550.6 | 1561.4 | 1569.8 | 1560.2 |
| 160°   | 1581.7 | 1574.4 | 1581.7 | 1588.8 | 1580.5 |
| 162.5° | 1600.7 | 1593.6 | 1599.5 | 1607.9 | 1597.2 |
| 165°   | 1617.5 | 1610.4 | 1613.9 | 1622.3 | 1613.9 |
| 167.5° | 1630.6 | 1623.4 | 1627.1 | 1635.5 | 1624.6 |
| 170°   | 1641.4 | 1634.2 | 1636.6 | 1644.9 | 1634.2 |
| 172.5° | 1648.5 | 1641.4 | 1643.8 | 1652.2 | 1641.4 |
| 175°   | 1654.5 | 1646.1 | 1648.5 | 1656.8 | 1644.9 |
| 177.5° | 1656.8 | 1648.5 | 1649.8 | 1658.2 | 1647.4 |
| 180°   | 1650.9 | 1650.9 | 1650.9 | 1650.9 | 1650.9 |

TEST NUMBER: P917083

CATALOG NUMBER: DFN2DIP-PN4F0-120D060US930-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 | 12.07            | 13.02 | 12.91 | 13.88 | 14.95 | 8.03           | 8.98  | 8.87  | 9.84  | 10.91 |
|                 | 3H   | 13.76            | 14.61 | 14.61 | 15.48 | 16.58 | 9.23           | 10.08 | 10.09 | 10.95 | 12.05 |
|                 | 4H   | 14.37            | 15.18 | 15.24 | 16.05 | 17.16 | 9.69           | 10.49 | 10.56 | 11.36 | 12.47 |
|                 | 6H   | 14.80            | 15.54 | 15.69 | 16.42 | 17.55 | 10.01          | 10.75 | 10.90 | 11.64 | 12.76 |
|                 | 8H   | 14.93            | 15.64 | 15.83 | 16.54 | 17.66 | 10.11          | 10.81 | 11.00 | 11.71 | 12.83 |
|                 | 12H  | 15.00            | 15.67 | 15.90 | 16.56 | 17.71 | 10.16          | 10.83 | 11.05 | 11.72 | 12.87 |
| 4H              | 2H   | 12.10            | 12.90 | 12.98 | 13.78 | 14.89 | 8.64           | 9.45  | 9.52  | 10.32 | 11.43 |
|                 | 3H   | 13.94            | 14.61 | 14.83 | 15.52 | 16.64 | 10.01          | 10.67 | 10.89 | 11.58 | 12.70 |
|                 | 4H   | 14.64            | 15.25 | 15.54 | 16.15 | 17.30 | 10.56          | 11.17 | 11.46 | 12.07 | 13.22 |
|                 | 6H   | 15.17            | 15.69 | 16.08 | 16.62 | 17.77 | 10.99          | 11.51 | 11.90 | 12.44 | 13.59 |
|                 | 8H   | 15.35            | 15.83 | 16.26 | 16.76 | 17.92 | 11.12          | 11.61 | 12.03 | 12.53 | 13.69 |
|                 | 12H  | 15.45            | 15.89 | 16.38 | 16.83 | 18.00 | 11.19          | 11.63 | 12.12 | 12.57 | 13.74 |
| 8H              | 4H   | 14.62            | 15.11 | 15.53 | 16.03 | 17.20 | 10.85          | 11.34 | 11.77 | 12.26 | 13.43 |
|                 | 6H   | 15.19            | 15.60 | 16.13 | 16.56 | 17.73 | 11.37          | 11.78 | 12.32 | 12.74 | 13.91 |
|                 | 8H   | 15.41            | 15.77 | 16.36 | 16.72 | 17.91 | 11.57          | 11.92 | 12.52 | 12.88 | 14.06 |
|                 | 12H  | 15.56            | 15.87 | 16.51 | 16.82 | 18.05 | 11.69          | 12.01 | 12.65 | 12.95 | 14.19 |
| 12H             | 4H   | 14.58            | 15.02 | 15.51 | 15.96 | 17.13 | 10.86          | 11.30 | 11.80 | 12.24 | 13.41 |
|                 | 6H   | 15.17            | 15.53 | 16.12 | 16.48 | 17.66 | 11.42          | 11.78 | 12.38 | 12.74 | 13.92 |
|                 | 8H   | 15.40            | 15.71 | 16.35 | 16.66 | 17.89 | 11.64          | 11.96 | 12.59 | 12.90 | 14.14 |