

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: P916487

Luminaire Tested: DFN2DIP-HX4F0-120D120US930-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P916487  
REPORT IS A COMBINATION OF REPORTS P899460 AND P896188  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-120D120US930-RLLFLL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

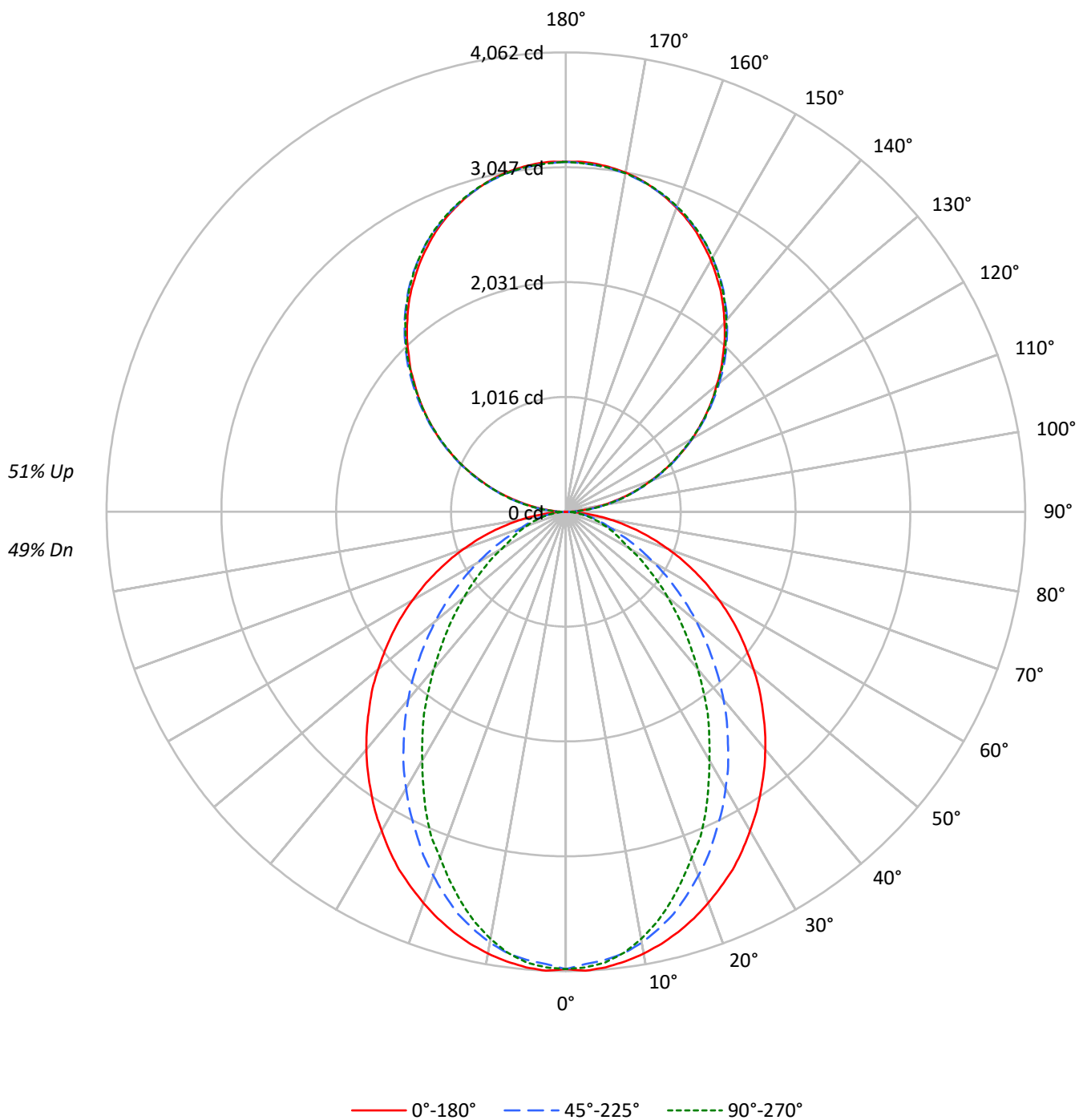
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 16974.5 lumens  
Efficiency: N/A  
Efficacy: 85.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 199.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9954  
Total Harmonic Distortion (THDi): 0.076  
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



TEST NUMBER: P916487

CATALOG NUMBER: DFN2DIP-HX4F0-120D120US930-RLFL

**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   | 107 | 107 | 107 | 107 | 99 | 99 | 99 | 99 | 83 | 83 | 83 | 68 | 68 | 68 | 55 | 55 | 55 |
| 1   | 98  | 94  | 90  | 87  | 90 | 87 | 84 | 81 | 73 | 71 | 69 | 61 | 59 | 58 | 50 | 49 | 48 |
| 2   | 90  | 83  | 77  | 72  | 82 | 76 | 71 | 67 | 65 | 61 | 58 | 54 | 51 | 49 | 44 | 42 | 41 |
| 3   | 82  | 73  | 66  | 60  | 75 | 68 | 61 | 57 | 58 | 53 | 49 | 48 | 45 | 42 | 40 | 37 | 35 |
| 4   | 75  | 65  | 57  | 51  | 69 | 60 | 54 | 48 | 51 | 46 | 42 | 43 | 40 | 36 | 36 | 33 | 31 |
| 5   | 69  | 58  | 50  | 44  | 64 | 54 | 47 | 42 | 46 | 41 | 37 | 39 | 35 | 32 | 32 | 29 | 27 |
| 6   | 64  | 52  | 44  | 39  | 59 | 49 | 42 | 37 | 42 | 36 | 32 | 35 | 31 | 28 | 30 | 26 | 24 |
| 7   | 59  | 47  | 40  | 34  | 55 | 44 | 37 | 32 | 38 | 33 | 29 | 32 | 28 | 25 | 27 | 24 | 22 |
| 8   | 55  | 43  | 36  | 30  | 51 | 40 | 33 | 29 | 35 | 29 | 26 | 30 | 26 | 23 | 25 | 22 | 20 |
| 9   | 51  | 39  | 32  | 27  | 47 | 37 | 30 | 26 | 32 | 27 | 23 | 27 | 23 | 20 | 23 | 20 | 18 |
| 10  | 48  | 36  | 29  | 24  | 44 | 34 | 28 | 23 | 30 | 24 | 21 | 25 | 21 | 19 | 22 | 18 | 16 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3007 | 3007 | 3007 |
| 5°  | 3012 | 2959 | 2978 |
| 10° | 2982 | 2901 | 2881 |
| 15° | 2941 | 2806 | 2732 |
| 20° | 2887 | 2674 | 2548 |
| 25° | 2832 | 2526 | 2370 |
| 30° | 2757 | 2374 | 2145 |
| 35° | 2685 | 2211 | 1948 |
| 40° | 2610 | 2042 | 1721 |
| 45° | 2524 | 1855 | 1516 |
| 50° | 2435 | 1666 | 1315 |
| 55° | 2342 | 1464 | 1122 |
| 60° | 2234 | 1252 | 924  |
| 65° | 2111 | 1037 | 831  |
| 70° | 1961 | 837  | 753  |
| 75° | 1772 | 738  | 685  |
| 80° | 1500 | 620  | 595  |
| 85° | 1049 | 416  | 448  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2524 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 379.0   | 2.2       |
| 10°-20°   | 1040.3  | 6.1       |
| 20°-30°   | 1460.6  | 8.6       |
| 30°-40°   | 1592.1  | 9.4       |
| 40°-50°   | 1463.4  | 8.6       |
| 50°-60°   | 1149.2  | 6.8       |
| 60°-70°   | 748.0   | 4.4       |
| 70°-80°   | 385.1   | 2.3       |
| 80°-90°   | 107.1   | 0.6       |
| 90°-100°  | 191.5   | 1.1       |
| 100°-110° | 608.3   | 3.6       |
| 110°-120° | 1041.1  | 6.1       |
| 120°-130° | 1369.2  | 8.1       |
| 130°-140° | 1536.9  | 9.1       |
| 140°-150° | 1507.1  | 8.9       |
| 150°-160° | 1264.2  | 7.4       |
| 160°-170° | 838.4   | 4.9       |
| 170°-180° | 293.0   | 1.7       |
| 0°-30°    | 2879.9  | 17.0      |
| 0°-40°    | 4472.0  | 26.3      |
| 0°-60°    | 7084.6  | 41.7      |
| 0°-90°    | 8324.8  | 49.0      |
| 90°-120°  | 1840.9  | 10.8      |
| 90°-150°  | 6254.0  | 36.8      |
| 90°-180°  | 8650.0  | 51.0      |
| 0°-180°   | 16974.5 | 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°  | 3    | 34    | 91   | 86    | 89   | 17   |
| 95°  | 136  | 162   | 167  | 167   | 162  | 152  |
| 105° | 562  | 569   | 575  | 579   | 579  | 593  |
| 115° | 1045 | 1060  | 1055 | 1052  | 1045 | 1033 |
| 125° | 1520 | 1543  | 1536 | 1527  | 1524 | 1358 |
| 135° | 1965 | 1994  | 2000 | 1997  | 1990 | 1519 |
| 145° | 2386 | 2405  | 2420 | 2423  | 2412 | 1491 |
| 155° | 2728 | 2736  | 2744 | 2757  | 2749 | 1256 |
| 165° | 2968 | 2966  | 2966 | 2984  | 2971 | 837  |
| 175° | 3089 | 3081  | 3076 | 3094  | 3078 | 293  |
| 180° | 3094 | 3094  | 3094 | 3094  | 3094 |      |

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**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°    | 2.8    | 33.6   | 91.4   | 85.9   | 88.6   |
| 92.5°  | 57.8   | 78.4   | 81.1   | 84.0   | 84.0   |
| 95°    | 136.2  | 162.3  | 167.0  | 167.0  | 162.3  |
| 97.5°  | 226.7  | 250.9  | 261.2  | 261.2  | 261.2  |
| 100°   | 331.2  | 352.6  | 360.0  | 360.0  | 357.3  |
| 102.5° | 441.2  | 457.1  | 467.3  | 470.2  | 467.3  |
| 105°   | 561.6  | 569.0  | 574.6  | 579.3  | 579.3  |
| 107.5° | 680.9  | 692.2  | 692.2  | 694.0  | 680.9  |
| 110°   | 796.6  | 811.5  | 811.5  | 811.5  | 804.1  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 921.6  | 937.5  | 934.7  | 927.2  | 921.6  |
| 115°   | 1044.7 | 1059.7 | 1055.0 | 1052.2 | 1044.7 |
| 117.5° | 1166.9 | 1187.5 | 1174.4 | 1166.9 | 1159.5 |
| 120°   | 1290.1 | 1310.6 | 1290.1 | 1290.1 | 1281.7 |
| 122.5° | 1402.1 | 1428.2 | 1415.1 | 1407.6 | 1402.1 |
| 125°   | 1519.6 | 1542.9 | 1535.5 | 1527.1 | 1524.2 |
| 127.5° | 1634.3 | 1663.2 | 1652.9 | 1641.8 | 1634.3 |
| 130°   | 1741.6 | 1775.1 | 1770.5 | 1764.9 | 1754.6 |
| 132.5° | 1861.9 | 1888.1 | 1889.9 | 1876.8 | 1869.4 |
| 135°   | 1965.4 | 1994.4 | 2000.0 | 1997.2 | 1989.7 |
| 137.5° | 2081.1 | 2104.4 | 2109.1 | 2107.2 | 2096.1 |
| 140°   | 2182.8 | 2206.1 | 2219.2 | 2219.2 | 2208.9 |
| 142.5° | 2287.3 | 2310.6 | 2318.1 | 2320.8 | 2310.6 |
| 145°   | 2386.1 | 2404.8 | 2419.7 | 2422.6 | 2412.3 |
| 147.5° | 2474.8 | 2498.1 | 2509.3 | 2514.0 | 2503.7 |
| 150°   | 2566.2 | 2582.0 | 2592.3 | 2600.7 | 2592.3 |
| 152.5° | 2647.4 | 2663.2 | 2676.3 | 2686.6 | 2676.3 |
| 155°   | 2728.5 | 2736.0 | 2744.4 | 2757.4 | 2749.0 |
| 157.5° | 2798.5 | 2804.1 | 2808.7 | 2827.4 | 2814.3 |
| 160°   | 2861.0 | 2866.6 | 2869.4 | 2885.3 | 2874.0 |
| 162.5° | 2918.8 | 2918.8 | 2921.6 | 2939.3 | 2926.3 |
| 165°   | 2968.3 | 2965.5 | 2965.5 | 2984.1 | 2971.0 |
| 167.5° | 3013.0 | 3004.6 | 3004.6 | 3023.3 | 3010.2 |
| 170°   | 3046.6 | 3039.1 | 3036.3 | 3055.0 | 3039.1 |
| 172.5° | 3069.9 | 3062.4 | 3059.7 | 3078.3 | 3062.4 |
| 175°   | 3088.6 | 3081.1 | 3075.5 | 3094.1 | 3078.3 |
| 177.5° | 3098.9 | 3091.4 | 3085.7 | 3101.6 | 3085.7 |
| 180°   | 3094.1 | 3094.1 | 3094.1 | 3094.1 | 3094.1 |

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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 | 10.88            | 11.70 | 11.85 | 12.68 | 13.97 | 6.85           | 7.68  | 7.83  | 8.66  | 9.95  |
|                 | 3H   | 12.56            | 13.29 | 13.54 | 14.28 | 15.59 | 8.04           | 8.78  | 9.03  | 9.77  | 11.08 |
|                 | 4H   | 13.17            | 13.86 | 14.16 | 14.86 | 16.17 | 8.49           | 9.19  | 9.49  | 10.18 | 11.50 |
|                 | 6H   | 13.59            | 14.23 | 14.60 | 15.23 | 16.56 | 8.82           | 9.46  | 9.82  | 10.46 | 11.79 |
|                 | 8H   | 13.72            | 14.32 | 14.73 | 15.34 | 16.67 | 8.91           | 9.52  | 9.92  | 10.53 | 11.86 |
|                 | 12H  | 13.78            | 14.36 | 14.80 | 15.37 | 16.72 | 8.95           | 9.53  | 9.97  | 10.54 | 11.89 |
| 4H              | 2H   | 10.90            | 11.59 | 11.90 | 12.59 | 13.91 | 7.45           | 8.14  | 8.45  | 9.14  | 10.46 |
|                 | 3H   | 12.73            | 13.31 | 13.74 | 14.33 | 15.66 | 8.80           | 9.38  | 9.81  | 10.40 | 11.73 |
|                 | 4H   | 13.42            | 13.95 | 14.44 | 14.96 | 16.32 | 9.35           | 9.88  | 10.37 | 10.89 | 12.25 |
|                 | 6H   | 13.94            | 14.39 | 14.97 | 15.43 | 16.78 | 9.77           | 10.22 | 10.80 | 11.26 | 12.61 |
|                 | 8H   | 14.11            | 14.54 | 15.14 | 15.57 | 16.93 | 9.90           | 10.32 | 10.93 | 11.36 | 12.72 |
|                 | 12H  | 14.21            | 14.59 | 15.26 | 15.64 | 17.01 | 9.97           | 10.35 | 11.01 | 11.39 | 12.77 |
| 8H              | 4H   | 13.39            | 13.81 | 14.42 | 14.84 | 16.21 | 9.63           | 10.05 | 10.66 | 11.08 | 12.45 |
|                 | 6H   | 13.96            | 14.30 | 15.01 | 15.38 | 16.74 | 10.15          | 10.50 | 11.20 | 11.57 | 12.94 |
|                 | 8H   | 14.17            | 14.48 | 15.23 | 15.54 | 16.92 | 10.34          | 10.65 | 11.40 | 11.71 | 13.09 |
|                 | 12H  | 14.31            | 14.58 | 15.38 | 15.64 | 17.06 | 10.46          | 10.73 | 11.53 | 11.79 | 13.21 |
| 12H             | 4H   | 13.34            | 13.72 | 14.39 | 14.77 | 16.14 | 9.63           | 10.02 | 10.68 | 11.06 | 12.43 |
|                 | 6H   | 13.93            | 14.24 | 14.99 | 15.30 | 16.68 | 10.20          | 10.51 | 11.26 | 11.57 | 12.95 |
|                 | 8H   | 14.15            | 14.42 | 15.22 | 15.48 | 16.90 | 10.41          | 10.68 | 11.48 | 11.73 | 13.16 |