

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: P925287

Luminaire Tested: DFN2DIP-PN4F0-120D110US950-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P925287  
REPORT IS A COMBINATION OF REPORTS P901272 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-120D110US950-RLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

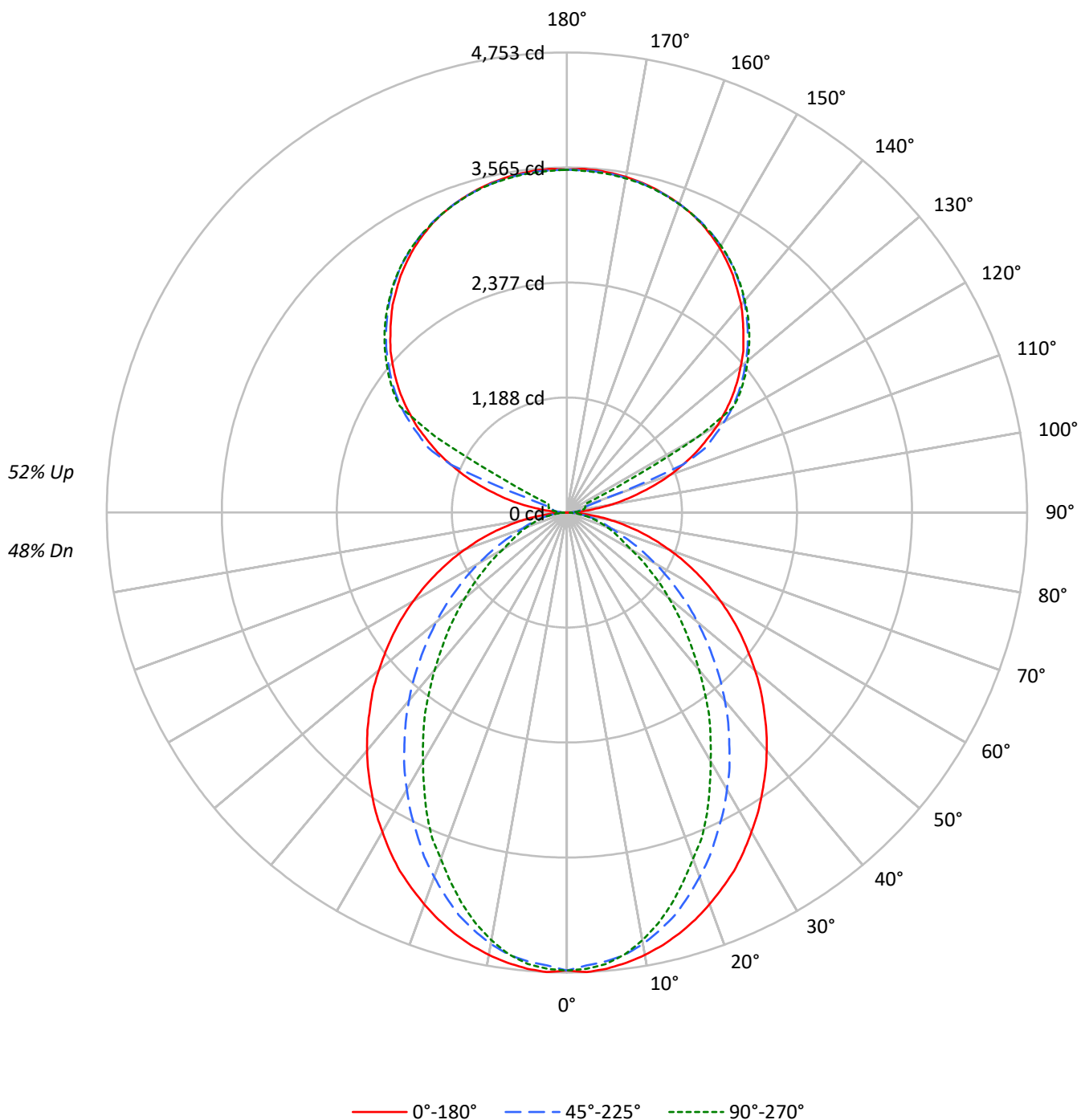
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 20119.8 lumens  
Efficiency: N/A  
Efficacy: 92.3 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: General Diffuse  
  
Input Watts (W): 217.9  
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

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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   | 107 | 107 | 107 | 107 | 98 | 98 | 98 | 98 | 82 | 82 | 82 | 68 | 68 | 68 | 55 | 55 | 55 |
| 1   | 98  | 94  | 90  | 87  | 90 | 87 | 83 | 80 | 73 | 71 | 69 | 60 | 59 | 58 | 49 | 48 | 47 |
| 2   | 90  | 82  | 77  | 72  | 82 | 76 | 71 | 67 | 64 | 61 | 58 | 54 | 51 | 49 | 44 | 42 | 40 |
| 3   | 82  | 73  | 66  | 60  | 75 | 67 | 61 | 56 | 57 | 53 | 49 | 48 | 45 | 42 | 39 | 37 | 35 |
| 4   | 75  | 65  | 57  | 51  | 69 | 60 | 53 | 48 | 51 | 46 | 42 | 43 | 39 | 36 | 35 | 33 | 30 |
| 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 | 36 | 42 | 36 | 32 | 35 | 31 | 28 | 29 | 26 | 24 |
| 7   | 59  | 47  | 39  | 34  | 54 | 44 | 37 | 32 | 38 | 32 | 29 | 32 | 28 | 25 | 27 | 24 | 21 |
| 8   | 55  | 43  | 35  | 30  | 51 | 40 | 33 | 29 | 35 | 29 | 25 | 30 | 25 | 22 | 25 | 22 | 19 |
| 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 | 27 | 23 | 29 | 24 | 21 | 25 | 21 | 18 | 21 | 18 | 16 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3454 | 3454 | 3454 |
| 5°  | 3459 | 3399 | 3421 |
| 10° | 3425 | 3333 | 3311 |
| 15° | 3378 | 3223 | 3139 |
| 20° | 3316 | 3072 | 2928 |
| 25° | 3252 | 2902 | 2725 |
| 30° | 3166 | 2728 | 2467 |
| 35° | 3082 | 2541 | 2240 |
| 40° | 2996 | 2347 | 1979 |
| 45° | 2897 | 2132 | 1743 |
| 50° | 2794 | 1915 | 1513 |
| 55° | 2687 | 1682 | 1291 |
| 60° | 2563 | 1439 | 1064 |
| 65° | 2420 | 1193 | 958  |
| 70° | 2247 | 962  | 868  |
| 75° | 2029 | 849  | 791  |
| 80° | 1714 | 714  | 688  |
| 85° | 1194 | 479  | 522  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2897 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 443.4   | 2.2       |
| 10°-20°   | 1217.3  | 6.1       |
| 20°-30°   | 1709.1  | 8.5       |
| 30°-40°   | 1863.0  | 9.3       |
| 40°-50°   | 1712.3  | 8.5       |
| 50°-60°   | 1344.7  | 6.7       |
| 60°-70°   | 875.3   | 4.4       |
| 70°-80°   | 450.6   | 2.2       |
| 80°-90°   | 121.3   | 0.6       |
| 90°-100°  | 116.8   | 0.6       |
| 100°-110° | 435.4   | 2.2       |
| 110°-120° | 1154.6  | 5.7       |
| 120°-130° | 1915.0  | 9.5       |
| 130°-140° | 2034.2  | 10.1      |
| 140°-150° | 1890.5  | 9.4       |
| 150°-160° | 1519.9  | 7.6       |
| 160°-170° | 979.4   | 4.9       |
| 170°-180° | 337.1   | 1.7       |
| 0°-30°    | 3369.8  | 16.7      |
| 0°-40°    | 5232.8  | 26.0      |
| 0°-60°    | 8289.9  | 41.2      |
| 0°-90°    | 9737.0  | 48.4      |
| 90°-120°  | 1706.7  | 8.5       |
| 90°-150°  | 7546.4  | 37.5      |
| 90°-180°  | 10383.0 | 51.6      |
| 0°-180°   | 20119.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4732 | 4732  | 4732 | 4732  | 4732 |      |
| 5°   | 4732 | 4710  | 4654 | 4693  | 4680 | 449  |
| 15°  | 4500 | 4453  | 4308 | 4226  | 4184 | 1268 |
| 25°  | 4085 | 3948  | 3665 | 3490  | 3425 | 1879 |
| 35°  | 3520 | 3301  | 2925 | 2655  | 2560 | 2203 |
| 45°  | 2878 | 2590  | 2141 | 1837  | 1734 | 2222 |
| 55°  | 2188 | 1854  | 1392 | 1135  | 1054 | 1955 |
| 65°  | 1477 | 1130  | 745  | 600   | 586  | 1465 |
| 75°  | 788  | 488   | 343  | 312   | 308  | 833  |
| 85°  | 184  | 94    | 81   | 81    | 81   | 211  |
| 90°  | 2    | 31    | 51   | 64    | 69   | 19   |
| 95°  | 166  | 82    | 100  | 113   | 110  | 197  |
| 105° | 779  | 856   | 156  | 184   | 195  | 832  |
| 115° | 1474 | 1517  | 1581 | 395   | 210  | 1451 |
| 125° | 2083 | 2117  | 2166 | 2183  | 2191 | 1858 |
| 135° | 2578 | 2619  | 2642 | 2668  | 2663 | 1992 |
| 145° | 2991 | 2988  | 3032 | 3050  | 3037 | 1871 |
| 155° | 3293 | 3270  | 3301 | 3316  | 3296 | 1517 |
| 165° | 3470 | 3454  | 3462 | 3480  | 3462 | 980  |
| 175° | 3549 | 3531  | 3536 | 3554  | 3529 | 338  |
| 180° | 3542 | 3542  | 3542 | 3542  | 3542 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4731.5 | 4731.5 | 4731.5 | 4731.5 | 4731.5 |
| 2.5°   | 4752.8 | 4731.5 | 4684.2 | 4727.4 | 4718.7 |
| 5°     | 4731.5 | 4710.1 | 4654.2 | 4692.8 | 4680.1 |
| 7.5°   | 4692.8 | 4667.3 | 4607.4 | 4624.2 | 4602.9 |
| 10°    | 4641.5 | 4611.5 | 4526.1 | 4512.9 | 4487.5 |
| 12.5°  | 4577.4 | 4538.8 | 4422.9 | 4397.6 | 4350.3 |
| 15°    | 4500.2 | 4453.0 | 4307.6 | 4226.2 | 4183.6 |
| 17.5°  | 4410.2 | 4341.7 | 4161.7 | 4067.8 | 3999.2 |
| 20°    | 4307.6 | 4221.7 | 4007.8 | 3901.0 | 3806.5 |
| 22.5°  | 4196.3 | 4097.7 | 3849.2 | 3703.8 | 3639.8 |
| 25°    | 4085.0 | 3947.7 | 3665.2 | 3489.8 | 3425.3 |
| 27.5°  | 3952.3 | 3806.5 | 3493.9 | 3292.7 | 3194.1 |
| 30°    | 3811.0 | 3648.0 | 3305.4 | 3087.3 | 2971.5 |
| 32.5°  | 3673.9 | 3476.7 | 3126.0 | 2868.9 | 2761.6 |
| 35°    | 3519.9 | 3301.3 | 2924.7 | 2654.9 | 2560.3 |
| 37.5°  | 3369.9 | 3134.2 | 2736.2 | 2440.4 | 2333.7 |
| 40°    | 3211.4 | 2954.7 | 2539.1 | 2235.1 | 2123.8 |
| 42.5°  | 3048.7 | 2774.8 | 2342.4 | 2025.2 | 1918.5 |
| 45°    | 2877.5 | 2590.4 | 2141.1 | 1836.7 | 1734.0 |
| 47.5°  | 2714.8 | 2410.9 | 1948.4 | 1644.1 | 1550.1 |
| 50°    | 2535.0 | 2231.0 | 1759.9 | 1464.2 | 1374.7 |
| 52.5°  | 2359.1 | 2037.9 | 1580.0 | 1297.4 | 1216.2 |
| 55°    | 2187.9 | 1854.0 | 1391.5 | 1134.8 | 1053.5 |
| 57.5°  | 2012.5 | 1670.0 | 1224.7 | 984.9  | 916.3  |
| 60°    | 1832.6 | 1490.1 | 1048.9 | 830.9  | 762.3  |
| 62.5°  | 1657.3 | 1314.7 | 899.0  | 693.7  | 659.6  |
| 65°    | 1477.4 | 1130.3 | 745.1  | 599.7  | 586.5  |
| 67.5°  | 1306.1 | 959.0  | 599.7  | 526.5  | 513.8  |
| 70°    | 1126.2 | 792.3  | 496.6  | 453.8  | 436.6  |
| 72.5°  | 955.0  | 637.8  | 415.2  | 381.1  | 372.5  |
| 75°    | 787.7  | 487.9  | 342.6  | 312.5  | 308.4  |
| 77.5°  | 621.1  | 346.6  | 269.9  | 252.6  | 243.9  |
| 80°    | 466.6  | 248.5  | 205.3  | 188.5  | 188.5  |
| 82.5°  | 325.3  | 167.1  | 141.3  | 132.6  | 132.6  |
| 85°    | 184.0  | 94.1   | 81.3   | 81.3   | 81.3   |
| 87.5°  | 68.6   | 34.1   | 34.1   | 30.0   | 30.0   |
| 90°    | 2.5    | 30.7   | 51.1   | 64.2   | 69.1   |
| 92.5°  | 64.2   | 53.9   | 61.4   | 66.7   | 69.1   |
| 95°    | 166.5  | 81.9   | 99.8   | 112.9  | 110.2  |
| 97.5°  | 299.7  | 89.8   | 130.5  | 138.4  | 140.9  |
| 100°   | 453.7  | 102.6  | 146.1  | 166.5  | 171.6  |
| 102.5° | 622.6  | 617.7  | 151.2  | 179.3  | 187.2  |
| 105°   | 779.0  | 856.0  | 156.5  | 184.4  | 194.8  |
| 107.5° | 961.1  | 1024.9 | 161.6  | 189.6  | 200.0  |
| 110°   | 1135.4 | 1189.0 | 448.6  | 192.3  | 202.3  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1299.4 | 1345.3 | 1301.8 | 197.2  | 205.1  |
| 115°   | 1473.5 | 1517.0 | 1581.3 | 394.7  | 210.3  |
| 117.5° | 1624.8 | 1675.9 | 1719.7 | 1353.0 | 681.6  |
| 120°   | 1793.9 | 1832.3 | 1878.5 | 1909.2 | 1563.2 |
| 122.5° | 1937.3 | 1978.3 | 2029.7 | 2045.0 | 2047.8 |
| 125°   | 2083.3 | 2116.8 | 2165.5 | 2183.4 | 2191.1 |
| 127.5° | 2216.6 | 2252.5 | 2291.1 | 2316.7 | 2319.2 |
| 130°   | 2342.3 | 2383.4 | 2411.3 | 2439.7 | 2437.3 |
| 132.5° | 2470.4 | 2503.9 | 2531.9 | 2555.0 | 2552.6 |
| 135°   | 2578.2 | 2619.2 | 2642.0 | 2668.0 | 2662.7 |
| 137.5° | 2690.8 | 2721.5 | 2747.3 | 2772.9 | 2765.3 |
| 140°   | 2800.9 | 2821.6 | 2849.6 | 2872.7 | 2859.9 |
| 142.5° | 2893.4 | 2911.3 | 2944.5 | 2964.9 | 2952.2 |
| 145°   | 2990.8 | 2988.0 | 3031.5 | 3049.6 | 3036.8 |
| 147.5° | 3075.1 | 3067.5 | 3111.0 | 3123.8 | 3113.8 |
| 150°   | 3157.3 | 3139.3 | 3180.3 | 3195.6 | 3182.8 |
| 152.5° | 3226.3 | 3205.9 | 3244.3 | 3259.8 | 3241.9 |
| 155°   | 3293.0 | 3270.1 | 3300.8 | 3316.1 | 3295.7 |
| 157.5° | 3346.8 | 3326.4 | 3349.6 | 3367.5 | 3346.8 |
| 160°   | 3393.1 | 3377.5 | 3393.1 | 3408.3 | 3390.3 |
| 162.5° | 3433.8 | 3418.7 | 3431.4 | 3449.4 | 3426.3 |
| 165°   | 3469.8 | 3454.5 | 3462.2 | 3480.1 | 3462.2 |
| 167.5° | 3498.0 | 3482.6 | 3490.5 | 3508.4 | 3485.3 |
| 170°   | 3521.2 | 3505.7 | 3510.8 | 3528.8 | 3505.7 |
| 172.5° | 3536.4 | 3521.2 | 3526.4 | 3544.3 | 3521.2 |
| 175°   | 3549.2 | 3531.2 | 3536.4 | 3554.4 | 3528.8 |
| 177.5° | 3554.4 | 3536.4 | 3539.1 | 3557.1 | 3534.0 |
| 180°   | 3541.6 | 3541.6 | 3541.6 | 3541.6 | 3541.6 |

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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 | 11.31            | 12.13 | 12.29 | 13.11 | 14.41 | 7.27           | 8.09  | 8.25  | 9.08  | 10.37 |
|                 | 3H   | 12.99            | 13.72 | 13.98 | 14.71 | 16.03 | 8.46           | 9.19  | 9.45  | 10.19 | 11.51 |
|                 | 4H   | 13.60            | 14.29 | 14.60 | 15.29 | 16.61 | 8.91           | 9.60  | 9.91  | 10.60 | 11.93 |
|                 | 6H   | 14.02            | 14.66 | 15.03 | 15.66 | 17.00 | 9.23           | 9.87  | 10.24 | 10.87 | 12.21 |
|                 | 8H   | 14.15            | 14.75 | 15.17 | 15.77 | 17.11 | 9.32           | 9.93  | 10.34 | 10.95 | 12.28 |
|                 | 12H  | 14.21            | 14.79 | 15.23 | 15.80 | 17.16 | 9.37           | 9.94  | 10.39 | 10.96 | 12.31 |
| 4H              | 2H   | 11.32            | 12.02 | 12.33 | 13.01 | 14.34 | 7.87           | 8.56  | 8.88  | 9.56  | 10.89 |
|                 | 3H   | 13.16            | 13.73 | 14.17 | 14.76 | 16.10 | 9.22           | 9.79  | 10.24 | 10.82 | 12.16 |
|                 | 4H   | 13.85            | 14.38 | 14.87 | 15.40 | 16.76 | 9.77           | 10.29 | 10.79 | 11.31 | 12.68 |
|                 | 6H   | 14.37            | 14.82 | 15.40 | 15.86 | 17.22 | 10.19          | 10.64 | 11.22 | 11.68 | 13.04 |
|                 | 8H   | 14.54            | 14.97 | 15.58 | 16.00 | 17.38 | 10.32          | 10.74 | 11.35 | 11.77 | 13.15 |
|                 | 12H  | 14.64            | 15.02 | 15.69 | 16.07 | 17.45 | 10.38          | 10.76 | 11.43 | 11.81 | 13.19 |
| 8H              | 4H   | 13.82            | 14.24 | 14.85 | 15.27 | 16.65 | 10.05          | 10.47 | 11.08 | 11.50 | 12.88 |
|                 | 6H   | 14.39            | 14.73 | 15.44 | 15.81 | 17.18 | 10.57          | 10.91 | 11.63 | 11.99 | 13.36 |
|                 | 8H   | 14.60            | 14.91 | 15.67 | 15.97 | 17.36 | 10.76          | 11.06 | 11.83 | 12.13 | 13.52 |
|                 | 12H  | 14.74            | 15.01 | 15.81 | 16.07 | 17.50 | 10.88          | 11.15 | 11.95 | 12.20 | 13.64 |
| 12H             | 4H   | 13.77            | 14.15 | 14.82 | 15.20 | 16.58 | 10.05          | 10.43 | 11.11 | 11.48 | 12.86 |
|                 | 6H   | 14.36            | 14.67 | 15.43 | 15.73 | 17.12 | 10.62          | 10.92 | 11.68 | 11.99 | 13.38 |
|                 | 8H   | 14.58            | 14.85 | 15.65 | 15.91 | 17.34 | 10.83          | 11.10 | 11.90 | 12.15 | 13.59 |