

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: P925209

Luminaire Tested: DFN2DIP-PN4F0-100D100US950-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P925209  
REPORT IS A COMBINATION OF REPORTS P901249 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-100D100US950-FLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

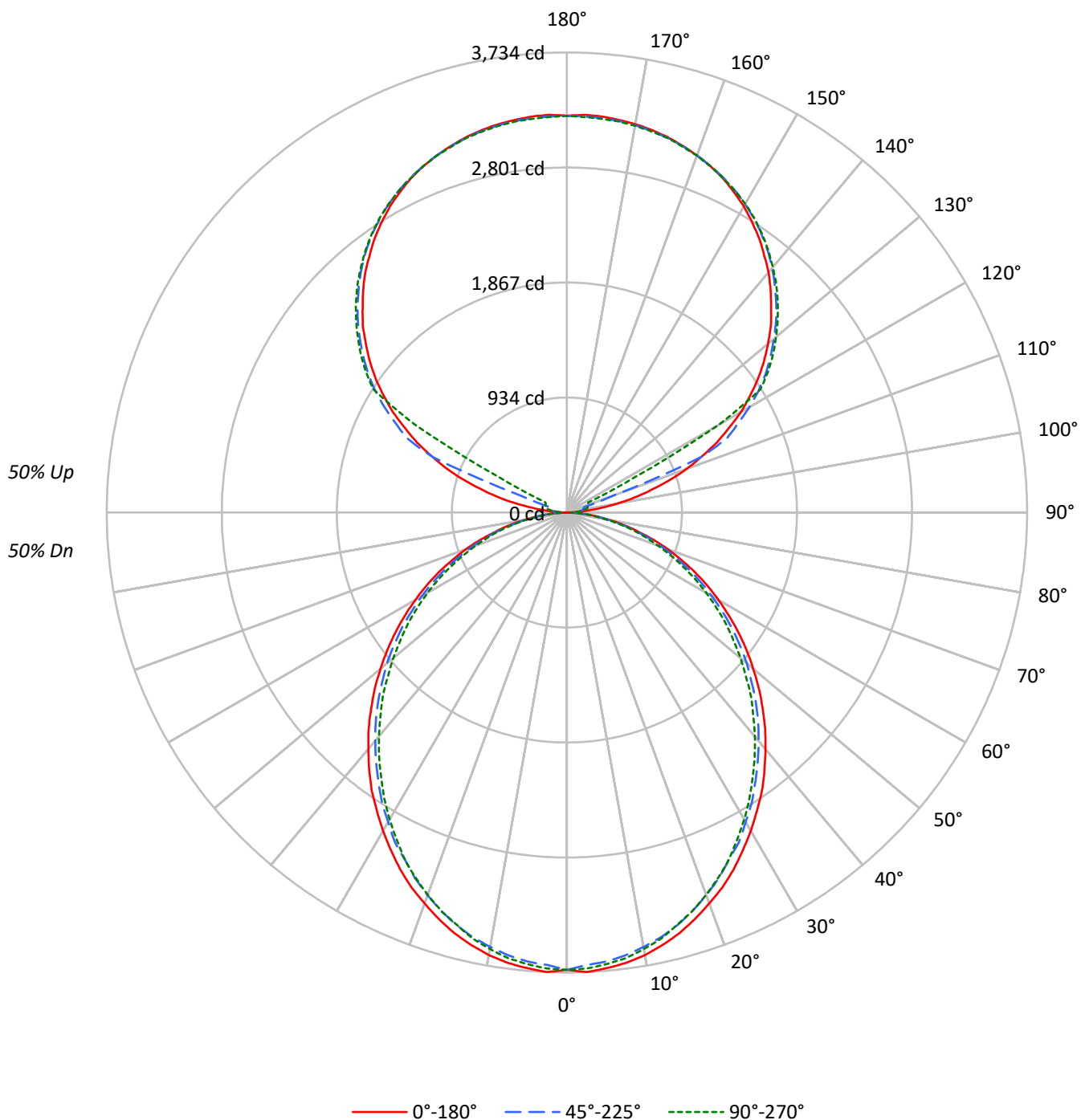
Lumens per Lamp: N/A  
Luminaire Lumens: 18889.2 lumens  
Efficiency: N/A  
Efficacy: 107.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 175.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9952  
Total Harmonic Distortion (THDi): 0.069  
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 | 99 | 99 | 99 | 99 | 83 | 83 | 83 | 69 | 69 | 69 | 56 | 56 | 56 |
| 1   | 98  | 93  | 90  | 86  | 90 | 86 | 83 | 80 | 73 | 71 | 68 | 61 | 59 | 58 | 50 | 48 | 47 |
| 2   | 89  | 82  | 75  | 70  | 82 | 76 | 70 | 66 | 64 | 60 | 57 | 53 | 51 | 48 | 44 | 42 | 40 |
| 3   | 81  | 72  | 64  | 59  | 75 | 66 | 60 | 55 | 56 | 52 | 48 | 47 | 44 | 41 | 39 | 36 | 34 |
| 4   | 74  | 64  | 56  | 50  | 68 | 59 | 52 | 47 | 50 | 45 | 41 | 42 | 38 | 35 | 35 | 32 | 29 |
| 5   | 68  | 57  | 48  | 42  | 63 | 53 | 45 | 40 | 45 | 39 | 35 | 38 | 34 | 30 | 31 | 28 | 26 |
| 6   | 63  | 51  | 43  | 37  | 58 | 47 | 40 | 35 | 40 | 35 | 31 | 34 | 30 | 27 | 28 | 25 | 23 |
| 7   | 58  | 46  | 38  | 32  | 53 | 43 | 36 | 30 | 37 | 31 | 27 | 31 | 27 | 23 | 26 | 23 | 20 |
| 8   | 54  | 42  | 34  | 29  | 50 | 39 | 32 | 27 | 33 | 28 | 24 | 28 | 24 | 21 | 24 | 20 | 18 |
| 9   | 50  | 38  | 30  | 25  | 46 | 35 | 29 | 24 | 31 | 25 | 21 | 26 | 22 | 19 | 22 | 19 | 16 |
| 10  | 47  | 35  | 28  | 23  | 43 | 33 | 26 | 22 | 28 | 23 | 19 | 24 | 20 | 17 | 20 | 17 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2710 | 2710 | 2710 |
| 5°  | 2714 | 2672 | 2690 |
| 10° | 2692 | 2637 | 2654 |
| 15° | 2652 | 2594 | 2598 |
| 20° | 2599 | 2534 | 2540 |
| 25° | 2546 | 2462 | 2473 |
| 30° | 2479 | 2395 | 2388 |
| 35° | 2416 | 2316 | 2298 |
| 40° | 2338 | 2237 | 2212 |
| 45° | 2260 | 2157 | 2125 |
| 50° | 2176 | 2073 | 2023 |
| 55° | 2087 | 1977 | 1930 |
| 60° | 1986 | 1862 | 1823 |
| 65° | 1877 | 1743 | 1697 |
| 70° | 1738 | 1598 | 1562 |
| 75° | 1544 | 1424 | 1438 |
| 80° | 1312 | 1203 | 1199 |
| 85° | 949  | 822  | 802  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2260 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 349.4   | 1.8       |
| 10°-20°   | 983.0   | 5.2       |
| 20°-30°   | 1444.7  | 7.6       |
| 30°-40°   | 1677.9  | 8.9       |
| 40°-50°   | 1675.8  | 8.9       |
| 50°-60°   | 1461.2  | 7.7       |
| 60°-70°   | 1080.2  | 5.7       |
| 70°-80°   | 611.1   | 3.2       |
| 80°-90°   | 167.0   | 0.9       |
| 90°-100°  | 106.2   | 0.6       |
| 100°-110° | 395.8   | 2.1       |
| 110°-120° | 1049.6  | 5.6       |
| 120°-130° | 1740.9  | 9.2       |
| 130°-140° | 1849.2  | 9.8       |
| 140°-150° | 1718.7  | 9.1       |
| 150°-160° | 1381.8  | 7.3       |
| 160°-170° | 890.4   | 4.7       |
| 170°-180° | 306.5   | 1.6       |
| 0°-30°    | 2777.1  | 14.7      |
| 0°-40°    | 4454.9  | 23.6      |
| 0°-60°    | 7592.0  | 40.2      |
| 0°-90°    | 9450.3  | 50.0      |
| 90°-120°  | 1551.6  | 8.2       |
| 90°-150°  | 6860.4  | 36.3      |
| 90°-180°  | 9439.0  | 50.0      |
| 0°-180°   | 18889.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3712 | 3712  | 3712 | 3712  | 3712 |      |
| 5°   | 3712 | 3698  | 3659 | 3687  | 3680 | 352  |
| 15°  | 3534 | 3512  | 3466 | 3480  | 3462 | 995  |
| 25°  | 3198 | 3170  | 3109 | 3116  | 3109 | 1472 |
| 35°  | 2759 | 2724  | 2666 | 2645  | 2627 | 1723 |
| 45°  | 2245 | 2220  | 2166 | 2128  | 2113 | 1733 |
| 55°  | 1699 | 1678  | 1635 | 1592  | 1574 | 1519 |
| 65°  | 1146 | 1124  | 1089 | 1057  | 1039 | 1133 |
| 75°  | 600  | 593   | 574  | 553   | 560  | 640  |
| 85°  | 146  | 143   | 139  | 128   | 125  | 163  |
| 90°  | 2    | 28    | 46   | 58    | 63   | 17   |
| 95°  | 151  | 74    | 91   | 103   | 100  | 179  |
| 105° | 708  | 778   | 142  | 168   | 177  | 757  |
| 115° | 1340 | 1379  | 1438 | 359   | 191  | 1319 |
| 125° | 1894 | 1924  | 1969 | 1985  | 1992 | 1689 |
| 135° | 2344 | 2381  | 2402 | 2425  | 2421 | 1810 |
| 145° | 2719 | 2716  | 2756 | 2772  | 2761 | 1700 |
| 155° | 2994 | 2973  | 3001 | 3015  | 2996 | 1380 |
| 165° | 3154 | 3140  | 3147 | 3164  | 3147 | 891  |
| 175° | 3226 | 3210  | 3215 | 3231  | 3208 | 307  |
| 180° | 3220 | 3220  | 3220 | 3220  | 3220 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3712.1 | 3712.1 | 3712.1 | 3712.1 | 3712.1 |
| 2.5°   | 3733.7 | 3715.8 | 3676.4 | 3712.1 | 3705.2 |
| 5°     | 3712.1 | 3698.1 | 3658.7 | 3687.1 | 3680.2 |
| 7.5°   | 3687.1 | 3665.8 | 3626.4 | 3655.3 | 3648.1 |
| 10°    | 3648.1 | 3623.1 | 3580.3 | 3608.7 | 3598.1 |
| 12.5°  | 3594.3 | 3573.1 | 3530.3 | 3548.1 | 3540.9 |
| 15°    | 3533.7 | 3512.5 | 3465.9 | 3480.3 | 3462.5 |
| 17.5°  | 3458.7 | 3437.5 | 3390.9 | 3408.7 | 3390.9 |
| 20°    | 3376.5 | 3355.3 | 3305.3 | 3315.9 | 3301.9 |
| 22.5°  | 3294.7 | 3262.6 | 3215.9 | 3215.9 | 3208.8 |
| 25°    | 3198.2 | 3169.8 | 3109.2 | 3116.0 | 3109.2 |
| 27.5°  | 3091.0 | 3066.0 | 3019.8 | 3009.2 | 2991.4 |
| 30°    | 2984.2 | 2955.4 | 2902.0 | 2891.4 | 2877.0 |
| 32.5°  | 2869.8 | 2848.6 | 2791.4 | 2769.8 | 2755.4 |
| 35°    | 2759.3 | 2723.7 | 2666.4 | 2644.9 | 2627.0 |
| 37.5°  | 2634.3 | 2602.0 | 2544.9 | 2519.9 | 2502.1 |
| 40°    | 2505.9 | 2477.1 | 2419.9 | 2388.1 | 2373.7 |
| 42.5°  | 2380.9 | 2352.1 | 2295.3 | 2259.4 | 2238.2 |
| 45°    | 2245.3 | 2220.3 | 2166.5 | 2127.5 | 2113.2 |
| 47.5°  | 2113.2 | 2088.2 | 2031.0 | 1991.6 | 1970.4 |
| 50°    | 1973.8 | 1956.0 | 1906.0 | 1856.0 | 1838.3 |
| 52.5°  | 1838.3 | 1813.3 | 1767.0 | 1727.7 | 1702.7 |
| 55°    | 1699.3 | 1677.7 | 1634.9 | 1592.0 | 1574.3 |
| 57.5°  | 1559.9 | 1542.0 | 1495.5 | 1452.8 | 1438.3 |
| 60°    | 1420.5 | 1406.5 | 1356.5 | 1317.1 | 1306.5 |
| 62.5°  | 1284.9 | 1259.9 | 1224.4 | 1188.8 | 1174.4 |
| 65°    | 1145.9 | 1124.4 | 1088.8 | 1056.6 | 1038.8 |
| 67.5°  | 1003.2 | 985.0  | 953.2  | 928.2  | 913.8  |
| 70°    | 871.0  | 856.6  | 824.4  | 799.5  | 785.4  |
| 72.5°  | 735.4  | 721.0  | 703.3  | 678.3  | 667.6  |
| 75°    | 599.5  | 592.7  | 574.5  | 553.3  | 560.5  |
| 77.5°  | 478.3  | 463.9  | 456.7  | 446.1  | 435.5  |
| 80°    | 357.1  | 353.4  | 346.1  | 335.5  | 328.4  |
| 82.5°  | 242.8  | 242.8  | 239.4  | 225.0  | 225.0  |
| 85°    | 146.2  | 142.8  | 139.4  | 128.4  | 125.0  |
| 87.5°  | 64.4   | 57.1   | 50.0   | 39.4   | 35.6   |
| 90°    | 2.2    | 28.0   | 46.5   | 58.4   | 62.8   |
| 92.5°  | 58.4   | 48.9   | 55.9   | 60.6   | 62.8   |
| 95°    | 151.3  | 74.4   | 90.7   | 102.7  | 100.2  |
| 97.5°  | 272.5  | 81.6   | 118.7  | 125.8  | 128.1  |
| 100°   | 412.5  | 93.2   | 132.8  | 151.3  | 156.1  |
| 102.5° | 566.0  | 561.6  | 137.5  | 162.9  | 170.1  |
| 105°   | 708.2  | 778.2  | 142.2  | 167.6  | 177.1  |
| 107.5° | 873.7  | 931.8  | 146.9  | 172.4  | 181.7  |
| 110°   | 1032.1 | 1080.9 | 407.7  | 174.9  | 183.9  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1181.2 | 1223.0 | 1183.5 | 179.3  | 186.5  |
| 115°   | 1339.5 | 1379.1 | 1437.5 | 358.8  | 191.2  |
| 117.5° | 1477.0 | 1523.5 | 1563.3 | 1230.0 | 619.7  |
| 120°   | 1630.9 | 1665.7 | 1707.8 | 1735.7 | 1421.2 |
| 122.5° | 1761.2 | 1798.5 | 1845.2 | 1859.1 | 1861.5 |
| 125°   | 1894.0 | 1924.4 | 1968.7 | 1985.0 | 1991.9 |
| 127.5° | 2015.1 | 2047.8 | 2082.9 | 2106.1 | 2108.3 |
| 130°   | 2129.3 | 2166.7 | 2192.2 | 2217.9 | 2215.7 |
| 132.5° | 2245.8 | 2276.2 | 2301.7 | 2322.7 | 2320.5 |
| 135°   | 2343.8 | 2381.1 | 2401.9 | 2425.4 | 2420.7 |
| 137.5° | 2446.2 | 2474.1 | 2497.6 | 2520.8 | 2513.9 |
| 140°   | 2546.2 | 2565.1 | 2590.5 | 2611.6 | 2599.9 |
| 142.5° | 2630.4 | 2646.7 | 2676.8 | 2695.3 | 2683.8 |
| 145°   | 2718.9 | 2716.4 | 2756.0 | 2772.3 | 2760.7 |
| 147.5° | 2795.5 | 2788.6 | 2828.1 | 2839.8 | 2830.7 |
| 150°   | 2870.2 | 2853.9 | 2891.3 | 2905.1 | 2893.5 |
| 152.5° | 2933.0 | 2914.5 | 2949.4 | 2963.4 | 2947.1 |
| 155°   | 2993.7 | 2972.9 | 3000.8 | 3014.6 | 2996.1 |
| 157.5° | 3042.6 | 3024.1 | 3045.1 | 3061.4 | 3042.6 |
| 160°   | 3084.7 | 3070.5 | 3084.7 | 3098.5 | 3082.2 |
| 162.5° | 3121.7 | 3107.8 | 3119.5 | 3135.8 | 3114.8 |
| 165°   | 3154.3 | 3140.5 | 3147.4 | 3163.8 | 3147.4 |
| 167.5° | 3180.1 | 3165.9 | 3173.2 | 3189.5 | 3168.4 |
| 170°   | 3201.1 | 3187.0 | 3191.7 | 3208.0 | 3187.0 |
| 172.5° | 3214.9 | 3201.1 | 3205.8 | 3222.1 | 3201.1 |
| 175°   | 3226.5 | 3210.2 | 3214.9 | 3231.3 | 3208.0 |
| 177.5° | 3231.3 | 3214.9 | 3217.5 | 3233.8 | 3212.7 |
| 180°   | 3219.7 | 3219.7 | 3219.7 | 3219.7 | 3219.7 |

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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 | 10.74            | 11.61 | 11.70 | 12.58 | 13.85 | 10.31          | 11.17 | 11.26 | 12.14 | 13.41 |
|                 | 3H   | 12.41            | 13.18 | 13.38 | 14.16 | 15.46 | 11.92          | 12.70 | 12.89 | 13.68 | 14.97 |
|                 | 4H   | 13.00            | 13.73 | 13.98 | 14.71 | 16.02 | 12.51          | 13.24 | 13.49 | 14.23 | 15.53 |
|                 | 6H   | 13.40            | 14.07 | 14.39 | 15.06 | 16.38 | 12.91          | 13.58 | 13.90 | 14.57 | 15.89 |
|                 | 8H   | 13.51            | 14.15 | 14.50 | 15.15 | 16.47 | 13.01          | 13.66 | 14.01 | 14.66 | 15.97 |
|                 | 12H  | 13.56            | 14.17 | 14.56 | 15.17 | 16.50 | 13.06          | 13.67 | 14.06 | 14.67 | 16.00 |
| 4H              | 2H   | 11.21            | 11.94 | 12.19 | 12.92 | 14.22 | 10.86          | 11.59 | 11.84 | 12.57 | 13.87 |
|                 | 3H   | 13.08            | 13.69 | 14.07 | 14.70 | 16.02 | 12.67          | 13.28 | 13.67 | 14.30 | 15.61 |
|                 | 4H   | 13.79            | 14.35 | 14.80 | 15.36 | 16.70 | 13.38          | 13.93 | 14.38 | 14.94 | 16.28 |
|                 | 6H   | 14.31            | 14.79 | 15.33 | 15.82 | 17.16 | 13.89          | 14.37 | 14.90 | 15.40 | 16.73 |
|                 | 8H   | 14.46            | 14.91 | 15.48 | 15.93 | 17.29 | 14.03          | 14.48 | 15.05 | 15.51 | 16.86 |
|                 | 12H  | 14.54            | 14.94 | 15.57 | 15.98 | 17.34 | 14.10          | 14.50 | 15.13 | 15.54 | 16.90 |
| 8H              | 4H   | 13.99            | 14.44 | 15.01 | 15.46 | 16.81 | 13.62          | 14.07 | 14.64 | 15.09 | 16.44 |
|                 | 6H   | 14.62            | 15.00 | 15.67 | 16.06 | 17.41 | 14.25          | 14.62 | 15.29 | 15.68 | 17.03 |
|                 | 8H   | 14.85            | 15.17 | 15.90 | 16.22 | 17.59 | 14.46          | 14.79 | 15.51 | 15.84 | 17.21 |
|                 | 12H  | 14.98            | 15.27 | 16.03 | 16.31 | 17.72 | 14.58          | 14.87 | 15.63 | 15.91 | 17.32 |
| 12H             | 4H   | 13.98            | 14.38 | 15.01 | 15.42 | 16.78 | 13.61          | 14.02 | 14.65 | 15.06 | 16.41 |
|                 | 6H   | 14.65            | 14.98 | 15.70 | 16.03 | 17.40 | 14.29          | 14.62 | 15.34 | 15.67 | 17.04 |
|                 | 8H   | 14.90            | 15.19 | 15.95 | 16.23 | 17.64 | 14.53          | 14.81 | 15.58 | 15.86 | 17.27 |

END OF REPORT