

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: P912362

Luminaire Tested: DFN2DIP-SQ4F0-120D120US850-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P912362  
REPORT IS A COMBINATION OF REPORTS P900180 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-120D120US850-RLLFLL  
Description: 4 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

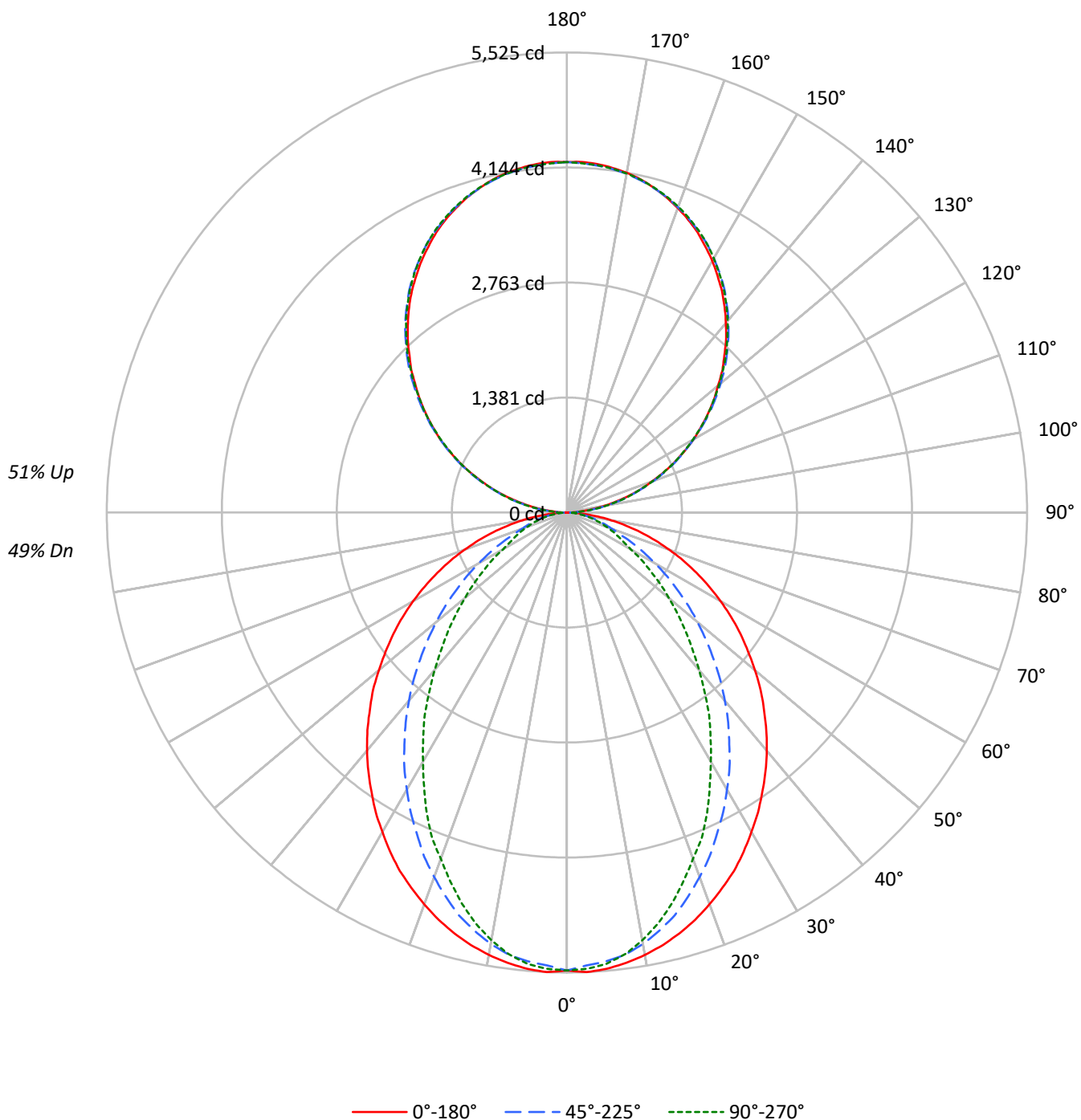
Lumens per Lamp: N/A  
Luminaire Lumens: 23089.3 lumens  
Efficiency: N/A  
Efficacy: 111.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 207.7  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9933  
Total Harmonic Distortion (THDi): 0.066  
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 | 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°  | 3859 | 3859 | 3859 |
| 5°  | 3865 | 3799 | 3824 |
| 10° | 3827 | 3725 | 3700 |
| 15° | 3774 | 3603 | 3509 |
| 20° | 3705 | 3434 | 3274 |
| 25° | 3633 | 3244 | 3047 |
| 30° | 3537 | 3050 | 2758 |
| 35° | 3443 | 2841 | 2505 |
| 40° | 3348 | 2624 | 2214 |
| 45° | 3237 | 2384 | 1950 |
| 50° | 3122 | 2141 | 1693 |
| 55° | 3002 | 1882 | 1446 |
| 60° | 2863 | 1610 | 1191 |
| 65° | 2703 | 1335 | 1073 |
| 70° | 2510 | 1077 | 973  |
| 75° | 2267 | 951  | 887  |
| 80° | 1915 | 801  | 773  |
| 85° | 1333 | 539  | 589  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 3312 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 515.5   | 2.2       |
| 10°-20°   | 1415.1  | 6.1       |
| 20°-30°   | 1986.8  | 8.6       |
| 30°-40°   | 2165.7  | 9.4       |
| 40°-50°   | 1990.5  | 8.6       |
| 50°-60°   | 1563.2  | 6.8       |
| 60°-70°   | 1017.5  | 4.4       |
| 70°-80°   | 523.8   | 2.3       |
| 80°-90°   | 145.7   | 0.6       |
| 90°-100°  | 260.4   | 1.1       |
| 100°-110° | 827.5   | 3.6       |
| 110°-120° | 1416.1  | 6.1       |
| 120°-130° | 1862.4  | 8.1       |
| 130°-140° | 2090.5  | 9.1       |
| 140°-150° | 2050.0  | 8.9       |
| 150°-160° | 1719.6  | 7.4       |
| 160°-170° | 1140.4  | 4.9       |
| 170°-180° | 398.6   | 1.7       |
| 0°-30°    | 3917.3  | 17.0      |
| 0°-40°    | 6083.0  | 26.3      |
| 0°-60°    | 9636.8  | 41.7      |
| 0°-90°    | 11323.7 | 49.0      |
| 90°-120°  | 2504.0  | 10.8      |
| 90°-150°  | 8506.9  | 36.8      |
| 90°-180°  | 11766.0 | 51.0      |
| 0°-180°   | 23089.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 5500 | 5500  | 5500 | 5500  | 5500 |      |
| 5°   | 5500 | 5475  | 5410 | 5455  | 5440 | 522  |
| 15°  | 5231 | 5176  | 5008 | 4913  | 4863 | 1474 |
| 25°  | 4749 | 4589  | 4261 | 4057  | 3982 | 2184 |
| 35°  | 4092 | 3838  | 3400 | 3086  | 2976 | 2561 |
| 45°  | 3345 | 3011  | 2489 | 2135  | 2016 | 2583 |
| 55°  | 2543 | 2155  | 1618 | 1319  | 1225 | 2273 |
| 65°  | 1717 | 1314  | 866  | 697   | 682  | 1703 |
| 75°  | 916  | 567   | 398  | 363   | 358  | 969  |
| 85°  | 214  | 109   | 94   | 94    | 94   | 246  |
| 90°  | 4    | 46    | 124  | 117   | 120  | 23   |
| 95°  | 185  | 221   | 227  | 227   | 221  | 206  |
| 105° | 764  | 774   | 782  | 788   | 788  | 806  |
| 115° | 1421 | 1442  | 1435 | 1431  | 1421 | 1406 |
| 125° | 2067 | 2099  | 2089 | 2077  | 2073 | 1847 |
| 135° | 2674 | 2713  | 2720 | 2717  | 2706 | 2066 |
| 145° | 3246 | 3271  | 3291 | 3295  | 3281 | 2028 |
| 155° | 3711 | 3722  | 3733 | 3751  | 3739 | 1708 |
| 165° | 4038 | 4034  | 4034 | 4059  | 4041 | 1139 |
| 175° | 4201 | 4191  | 4184 | 4209  | 4187 | 399  |
| 180° | 4209 | 4209  | 4209 | 4209  | 4209 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 5500.2 | 5500.2 | 5500.2 | 5500.2 | 5500.2 |
| 2.5°   | 5525.0 | 5500.2 | 5445.3 | 5495.4 | 5485.3 |
| 5°     | 5500.2 | 5475.4 | 5410.4 | 5455.3 | 5440.5 |
| 7.5°   | 5455.3 | 5425.7 | 5356.0 | 5375.5 | 5350.7 |
| 10°    | 5395.6 | 5360.8 | 5261.4 | 5246.1 | 5216.6 |
| 12.5°  | 5321.1 | 5276.3 | 5141.5 | 5112.0 | 5057.2 |
| 15°    | 5231.4 | 5176.5 | 5007.5 | 4912.9 | 4863.3 |
| 17.5°  | 5126.8 | 5047.1 | 4837.9 | 4728.7 | 4648.9 |
| 20°    | 5007.5 | 4907.7 | 4658.9 | 4534.8 | 4424.9 |
| 22.5°  | 4878.0 | 4763.5 | 4474.6 | 4305.6 | 4231.2 |
| 25°    | 4748.7 | 4589.2 | 4260.7 | 4056.8 | 3981.9 |
| 27.5°  | 4594.5 | 4424.9 | 4061.6 | 3827.7 | 3713.0 |
| 30°    | 4430.2 | 4240.7 | 3842.5 | 3588.9 | 3454.3 |
| 32.5°  | 4270.8 | 4041.5 | 3633.9 | 3335.0 | 3210.3 |
| 35°    | 4091.8 | 3837.7 | 3399.9 | 3086.2 | 2976.3 |
| 37.5°  | 3917.4 | 3643.4 | 3180.7 | 2836.9 | 2712.8 |
| 40°    | 3733.1 | 3434.8 | 2951.6 | 2598.3 | 2468.9 |
| 42.5°  | 3544.0 | 3225.6 | 2722.9 | 2354.3 | 2230.2 |
| 45°    | 3345.0 | 3011.3 | 2488.9 | 2135.2 | 2015.7 |
| 47.5°  | 3155.9 | 2802.7 | 2265.0 | 1911.3 | 1801.9 |
| 50°    | 2946.8 | 2593.5 | 2045.9 | 1702.1 | 1598.1 |
| 52.5°  | 2742.4 | 2369.0 | 1836.7 | 1508.2 | 1413.8 |
| 55°    | 2543.4 | 2155.2 | 1617.6 | 1319.2 | 1224.7 |
| 57.5°  | 2339.4 | 1941.3 | 1423.7 | 1144.9 | 1065.2 |
| 60°    | 2130.4 | 1732.1 | 1219.3 | 965.9  | 886.2  |
| 62.5°  | 1926.6 | 1528.3 | 1045.1 | 806.5  | 766.8  |
| 65°    | 1717.4 | 1313.9 | 866.1  | 697.1  | 681.8  |
| 67.5°  | 1518.3 | 1114.8 | 697.1  | 612.1  | 597.3  |
| 70°    | 1309.2 | 921.0  | 577.2  | 527.6  | 507.5  |
| 72.5°  | 1110.1 | 741.5  | 482.6  | 443.0  | 433.1  |
| 75°    | 915.7  | 567.1  | 398.2  | 363.3  | 358.5  |
| 77.5°  | 722.0  | 402.9  | 313.7  | 293.7  | 283.6  |
| 80°    | 542.4  | 288.9  | 238.7  | 219.1  | 219.1  |
| 82.5°  | 378.2  | 194.3  | 164.2  | 154.2  | 154.2  |
| 85°    | 213.9  | 109.3  | 94.5   | 94.5   | 94.5   |
| 87.5°  | 79.7   | 39.6   | 39.6   | 34.8   | 34.8   |
| 90°    | 3.8    | 45.7   | 124.3  | 116.8  | 120.5  |
| 92.5°  | 78.6   | 106.6  | 110.3  | 114.2  | 114.2  |
| 95°    | 185.2  | 220.8  | 227.1  | 227.1  | 220.8  |
| 97.5°  | 308.3  | 341.4  | 355.3  | 355.3  | 355.3  |
| 100°   | 450.5  | 479.6  | 489.7  | 489.7  | 486.0  |
| 102.5° | 600.2  | 621.7  | 635.7  | 639.6  | 635.7  |
| 105°   | 763.9  | 774.0  | 781.6  | 787.9  | 787.9  |
| 107.5° | 926.2  | 941.5  | 941.5  | 944.0  | 926.2  |
| 110°   | 1083.6 | 1103.9 | 1103.9 | 1103.9 | 1093.8 |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1253.6 | 1275.2 | 1271.4 | 1261.3 | 1253.6 |
| 115°   | 1421.1 | 1441.5 | 1435.0 | 1431.3 | 1421.1 |
| 117.5° | 1587.3 | 1615.3 | 1597.5 | 1587.3 | 1577.2 |
| 120°   | 1754.9 | 1782.7 | 1754.9 | 1754.9 | 1743.5 |
| 122.5° | 1907.1 | 1942.6 | 1924.9 | 1914.7 | 1907.1 |
| 125°   | 2067.0 | 2098.7 | 2088.6 | 2077.2 | 2073.3 |
| 127.5° | 2223.1 | 2262.4 | 2248.4 | 2233.2 | 2223.1 |
| 130°   | 2368.9 | 2414.6 | 2408.3 | 2400.7 | 2386.7 |
| 132.5° | 2532.6 | 2568.2 | 2570.7 | 2552.9 | 2542.8 |
| 135°   | 2673.5 | 2712.8 | 2720.5 | 2716.6 | 2706.5 |
| 137.5° | 2830.8 | 2862.6 | 2868.9 | 2866.3 | 2851.1 |
| 140°   | 2969.1 | 3000.8 | 3018.6 | 3018.6 | 3004.6 |
| 142.5° | 3111.3 | 3143.0 | 3153.1 | 3156.9 | 3143.0 |
| 145°   | 3245.7 | 3271.1 | 3291.4 | 3295.3 | 3281.3 |
| 147.5° | 3366.3 | 3398.0 | 3413.3 | 3419.6 | 3405.6 |
| 150°   | 3490.7 | 3512.2 | 3526.2 | 3537.6 | 3526.2 |
| 152.5° | 3601.0 | 3622.5 | 3640.4 | 3654.4 | 3640.4 |
| 155°   | 3711.4 | 3721.6 | 3733.0 | 3750.7 | 3739.3 |
| 157.5° | 3806.6 | 3814.2 | 3820.5 | 3845.9 | 3828.2 |
| 160°   | 3891.6 | 3899.2 | 3903.0 | 3924.6 | 3909.3 |
| 162.5° | 3970.2 | 3970.2 | 3974.1 | 3998.2 | 3980.4 |
| 165°   | 4037.5 | 4033.8 | 4033.8 | 4059.1 | 4041.3 |
| 167.5° | 4098.4 | 4087.0 | 4087.0 | 4112.4 | 4094.6 |
| 170°   | 4144.1 | 4133.9 | 4130.1 | 4155.5 | 4133.9 |
| 172.5° | 4175.8 | 4165.6 | 4161.9 | 4187.3 | 4165.6 |
| 175°   | 4201.2 | 4191.0 | 4183.5 | 4208.8 | 4187.3 |
| 177.5° | 4215.2 | 4205.0 | 4197.3 | 4219.0 | 4197.3 |
| 180°   | 4208.8 | 4208.8 | 4208.8 | 4208.8 | 4208.8 |

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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 | 11.76            | 12.58 | 12.73 | 13.56 | 14.85 | 7.72           | 8.54  | 8.69  | 9.52  | 10.81 |
|                 | 3H   | 13.44            | 14.18 | 14.42 | 15.17 | 16.48 | 8.91           | 9.64  | 9.89  | 10.63 | 11.94 |
|                 | 4H   | 14.05            | 14.75 | 15.05 | 15.74 | 17.06 | 9.36           | 10.05 | 10.36 | 11.05 | 12.37 |
|                 | 6H   | 14.48            | 15.12 | 15.48 | 16.12 | 17.45 | 9.68           | 10.32 | 10.69 | 11.32 | 12.65 |
|                 | 8H   | 14.61            | 15.21 | 15.62 | 16.23 | 17.56 | 9.77           | 10.38 | 10.78 | 11.40 | 12.72 |
|                 | 12H  | 14.67            | 15.25 | 15.69 | 16.26 | 17.61 | 9.81           | 10.39 | 10.83 | 11.40 | 12.75 |
| 4H              | 2H   | 11.78            | 12.47 | 12.78 | 13.47 | 14.78 | 8.32           | 9.01  | 9.32  | 10.01 | 11.32 |
|                 | 3H   | 13.61            | 14.19 | 14.62 | 15.21 | 16.54 | 9.67           | 10.25 | 10.68 | 11.27 | 12.60 |
|                 | 4H   | 14.31            | 14.83 | 15.32 | 15.85 | 17.20 | 10.22          | 10.74 | 11.23 | 11.76 | 13.11 |
|                 | 6H   | 14.82            | 15.28 | 15.85 | 16.32 | 17.67 | 10.64          | 11.09 | 11.67 | 12.13 | 13.48 |
|                 | 8H   | 15.00            | 15.43 | 16.03 | 16.46 | 17.82 | 10.76          | 11.19 | 11.80 | 12.22 | 13.59 |
|                 | 12H  | 15.10            | 15.48 | 16.15 | 16.53 | 17.90 | 10.83          | 11.21 | 11.88 | 12.26 | 13.63 |
| 8H              | 4H   | 14.27            | 14.70 | 15.30 | 15.73 | 17.09 | 10.50          | 10.92 | 11.53 | 11.95 | 13.32 |
|                 | 6H   | 14.84            | 15.19 | 15.90 | 16.27 | 17.63 | 11.02          | 11.37 | 12.07 | 12.44 | 13.80 |
|                 | 8H   | 15.06            | 15.37 | 16.12 | 16.43 | 17.81 | 11.21          | 11.52 | 12.27 | 12.58 | 13.96 |
|                 | 12H  | 15.20            | 15.48 | 16.27 | 16.53 | 17.95 | 11.33          | 11.60 | 12.39 | 12.65 | 14.08 |
| 12H             | 4H   | 14.22            | 14.61 | 15.27 | 15.65 | 17.02 | 10.50          | 10.89 | 11.55 | 11.93 | 13.30 |
|                 | 6H   | 14.82            | 15.13 | 15.88 | 16.19 | 17.57 | 11.07          | 11.38 | 12.13 | 12.43 | 13.82 |
|                 | 8H   | 15.04            | 15.31 | 16.11 | 16.37 | 17.79 | 11.28          | 11.55 | 12.34 | 12.60 | 14.03 |

END OF REPORT