

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: P925964

Luminaire Tested: DFN2DIP-SQ4F0-110D120US950-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P925964  
REPORT IS A COMBINATION OF REPORTS P900177 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-110D120US950-FLLFLL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

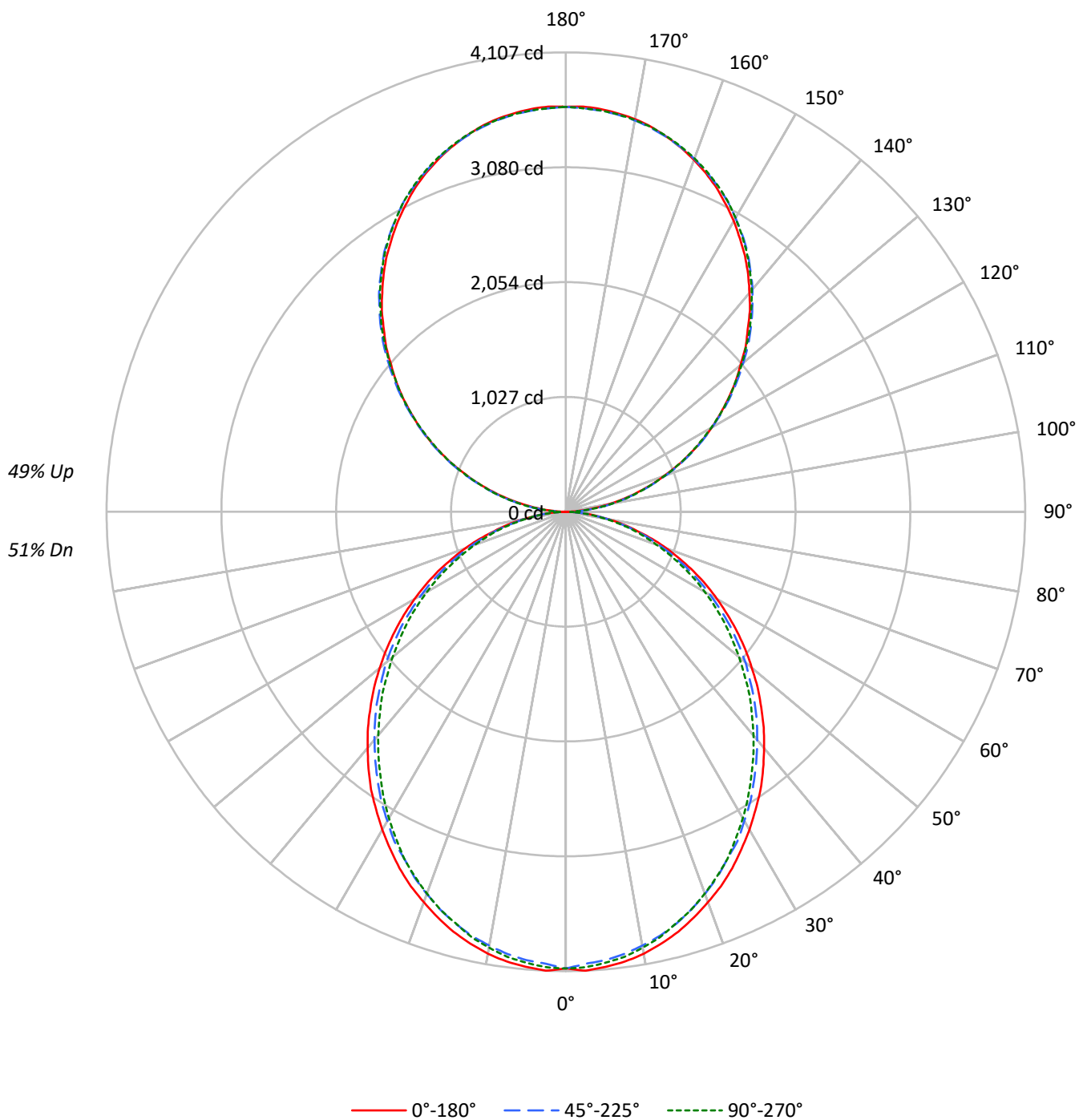
Lumens per Lamp: N/A  
Luminaire Lumens: 20520.5 lumens  
Efficiency: N/A  
Efficacy: 105.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 195.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9951  
Total Harmonic Distortion (THDi): 0.07  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P925964

CATALOG NUMBER: DFN2DIP-SQ4F0-110D120US950-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P925964

CATALOG NUMBER: DFN2DIP-SQ4F0-110D120US950-FLLFL

**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 | 84 | 84 | 84 | 70 | 70 | 70 | 57 | 57 | 57 |
| 1   | 98  | 94  | 90  | 86  | 90 | 87 | 83 | 80 | 73 | 71 | 69 | 61 | 60 | 58 | 50 | 49 | 48 |
| 2   | 89  | 82  | 76  | 70  | 82 | 76 | 70 | 66 | 64 | 60 | 57 | 54 | 51 | 48 | 44 | 42 | 40 |
| 3   | 81  | 72  | 65  | 59  | 75 | 67 | 60 | 55 | 57 | 52 | 48 | 48 | 44 | 41 | 39 | 37 | 34 |
| 4   | 74  | 64  | 56  | 50  | 68 | 59 | 52 | 47 | 50 | 45 | 41 | 42 | 38 | 35 | 35 | 32 | 30 |
| 5   | 68  | 57  | 49  | 43  | 63 | 53 | 45 | 40 | 45 | 40 | 35 | 38 | 34 | 30 | 32 | 28 | 26 |
| 6   | 63  | 51  | 43  | 37  | 58 | 47 | 40 | 35 | 41 | 35 | 31 | 34 | 30 | 27 | 29 | 25 | 23 |
| 7   | 58  | 46  | 38  | 32  | 54 | 43 | 36 | 31 | 37 | 31 | 27 | 31 | 27 | 24 | 26 | 23 | 20 |
| 8   | 54  | 42  | 34  | 29  | 50 | 39 | 32 | 27 | 34 | 28 | 24 | 29 | 24 | 21 | 24 | 21 | 18 |
| 9   | 50  | 38  | 31  | 25  | 46 | 36 | 29 | 24 | 31 | 25 | 22 | 26 | 22 | 19 | 22 | 19 | 16 |
| 10  | 47  | 35  | 28  | 23  | 43 | 33 | 26 | 22 | 28 | 23 | 19 | 24 | 20 | 17 | 21 | 17 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2865 | 2865 | 2865 |
| 5°  | 2870 | 2826 | 2845 |
| 10° | 2846 | 2788 | 2807 |
| 15° | 2805 | 2743 | 2748 |
| 20° | 2748 | 2680 | 2687 |
| 25° | 2692 | 2604 | 2617 |
| 30° | 2621 | 2534 | 2527 |
| 35° | 2554 | 2451 | 2432 |
| 40° | 2472 | 2367 | 2342 |
| 45° | 2390 | 2282 | 2249 |
| 50° | 2300 | 2194 | 2142 |
| 55° | 2206 | 2092 | 2044 |
| 60° | 2100 | 1971 | 1931 |
| 65° | 1984 | 1846 | 1799 |
| 70° | 1837 | 1693 | 1656 |
| 75° | 1632 | 1510 | 1526 |
| 80° | 1387 | 1277 | 1275 |
| 85° | 1002 | 874  | 857  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2850 cd/sqm

TEST NUMBER: P925964

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 384.3   | 1.9       |
| 10°-20°   | 1081.3  | 5.3       |
| 20°-30°   | 1589.1  | 7.7       |
| 30°-40°   | 1845.7  | 9.0       |
| 40°-50°   | 1843.4  | 9.0       |
| 50°-60°   | 1607.4  | 7.8       |
| 60°-70°   | 1188.2  | 5.8       |
| 70°-80°   | 672.3   | 3.3       |
| 80°-90°   | 187.7   | 0.9       |
| 90°-100°  | 224.0   | 1.1       |
| 100°-110° | 711.8   | 3.5       |
| 110°-120° | 1218.2  | 5.9       |
| 120°-130° | 1602.1  | 7.8       |
| 130°-140° | 1798.3  | 8.8       |
| 140°-150° | 1763.5  | 8.6       |
| 150°-160° | 1479.3  | 7.2       |
| 160°-170° | 981.0   | 4.8       |
| 170°-180° | 342.9   | 1.7       |
| 0°-30°    | 3054.8  | 14.9      |
| 0°-40°    | 4900.4  | 23.9      |
| 0°-60°    | 8351.2  | 40.7      |
| 0°-90°    | 10399.4 | 50.7      |
| 90°-120°  | 2154.1  | 10.5      |
| 90°-150°  | 7318.0  | 35.7      |
| 90°-180°  | 10121.0 | 49.3      |
| 0°-180°   | 20520.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4083 | 4083  | 4083 | 4083  | 4083 |      |
| 5°   | 4083 | 4068  | 4024 | 4056  | 4048 | 388  |
| 15°  | 3887 | 3864  | 3812 | 3828  | 3809 | 1095 |
| 25°  | 3518 | 3487  | 3420 | 3428  | 3420 | 1619 |
| 35°  | 3035 | 2996  | 2933 | 2909  | 2890 | 1895 |
| 45°  | 2470 | 2442  | 2383 | 2340  | 2324 | 1906 |
| 55°  | 1869 | 1845  | 1798 | 1751  | 1732 | 1671 |
| 65°  | 1260 | 1237  | 1198 | 1162  | 1143 | 1246 |
| 75°  | 659  | 652   | 632  | 609   | 617  | 704  |
| 85°  | 161  | 157   | 153  | 141   | 138  | 179  |
| 90°  | 3    | 39    | 107  | 100   | 104  | 20   |
| 95°  | 159  | 190   | 195  | 195   | 190  | 177  |
| 105° | 657  | 666   | 672  | 678   | 678  | 693  |
| 115° | 1222 | 1240  | 1234 | 1231  | 1222 | 1209 |
| 125° | 1778 | 1805  | 1797 | 1787  | 1784 | 1589 |
| 135° | 2300 | 2334  | 2340 | 2337  | 2328 | 1778 |
| 145° | 2792 | 2814  | 2831 | 2835  | 2823 | 1745 |
| 155° | 3193 | 3201  | 3211 | 3226  | 3217 | 1470 |
| 165° | 3473 | 3470  | 3470 | 3492  | 3476 | 980  |
| 175° | 3614 | 3605  | 3599 | 3620  | 3602 | 343  |
| 180° | 3620 | 3620  | 3620 | 3620  | 3620 |      |

TEST NUMBER: P925964

CATALOG NUMBER: DFN2DIP-SQ4F0-110D120US950-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4083.3 | 4083.3 | 4083.3 | 4083.3 | 4083.3 |
| 2.5°   | 4107.0 | 4087.4 | 4044.1 | 4083.3 | 4075.8 |
| 5°     | 4083.3 | 4067.9 | 4024.5 | 4055.7 | 4048.3 |
| 7.5°   | 4055.7 | 4032.5 | 3989.2 | 4020.8 | 4012.9 |
| 10°    | 4012.9 | 3985.3 | 3938.3 | 3969.5 | 3957.9 |
| 12.5°  | 3953.8 | 3930.4 | 3883.4 | 3902.9 | 3895.0 |
| 15°    | 3887.1 | 3863.7 | 3812.5 | 3828.3 | 3808.7 |
| 17.5°  | 3804.6 | 3781.3 | 3730.0 | 3749.6 | 3730.0 |
| 20°    | 3714.2 | 3690.8 | 3635.9 | 3647.5 | 3632.2 |
| 22.5°  | 3624.2 | 3588.8 | 3537.5 | 3537.5 | 3529.6 |
| 25°    | 3518.0 | 3486.8 | 3420.1 | 3427.6 | 3420.1 |
| 27.5°  | 3400.1 | 3372.6 | 3321.7 | 3310.1 | 3290.5 |
| 30°    | 3282.6 | 3250.9 | 3192.2 | 3180.5 | 3164.7 |
| 32.5°  | 3156.8 | 3133.5 | 3070.5 | 3046.8 | 3031.0 |
| 35°    | 3035.2 | 2996.0 | 2933.1 | 2909.3 | 2889.8 |
| 37.5°  | 2897.7 | 2862.3 | 2799.4 | 2771.8 | 2752.3 |
| 40°    | 2756.5 | 2724.8 | 2661.9 | 2626.9 | 2611.1 |
| 42.5°  | 2619.0 | 2587.3 | 2524.9 | 2485.3 | 2462.0 |
| 45°    | 2469.9 | 2442.3 | 2383.2 | 2340.4 | 2324.5 |
| 47.5°  | 2324.5 | 2297.0 | 2234.1 | 2190.8 | 2167.4 |
| 50°    | 2171.2 | 2151.7 | 2096.6 | 2041.7 | 2022.1 |
| 52.5°  | 2022.1 | 1994.5 | 1943.8 | 1900.4 | 1872.9 |
| 55°    | 1869.2 | 1845.4 | 1798.4 | 1751.3 | 1731.7 |
| 57.5°  | 1715.9 | 1696.3 | 1645.1 | 1597.9 | 1582.1 |
| 60°    | 1562.6 | 1547.2 | 1492.2 | 1448.8 | 1437.2 |
| 62.5°  | 1413.4 | 1386.0 | 1346.8 | 1307.6 | 1291.8 |
| 65°    | 1260.5 | 1236.8 | 1197.7 | 1162.3 | 1142.7 |
| 67.5°  | 1103.5 | 1083.6 | 1048.5 | 1021.1 | 1005.2 |
| 70°    | 958.1  | 942.3  | 906.9  | 879.4  | 863.9  |
| 72.5°  | 809.0  | 793.2  | 773.6  | 746.1  | 734.4  |
| 75°    | 659.4  | 652.0  | 631.9  | 608.7  | 616.6  |
| 77.5°  | 526.1  | 510.3  | 502.4  | 490.7  | 479.1  |
| 80°    | 392.9  | 388.7  | 380.7  | 369.1  | 361.2  |
| 82.5°  | 267.0  | 267.0  | 263.3  | 247.5  | 247.5  |
| 85°    | 160.8  | 157.0  | 153.3  | 141.2  | 137.5  |
| 87.5°  | 70.8   | 62.9   | 55.0   | 43.3   | 39.1   |
| 90°    | 3.2    | 39.3   | 106.9  | 100.5  | 103.7  |
| 92.5°  | 67.6   | 91.7   | 94.9   | 98.3   | 98.3   |
| 95°    | 159.3  | 189.9  | 195.4  | 195.4  | 189.9  |
| 97.5°  | 265.2  | 293.6  | 305.7  | 305.7  | 305.7  |
| 100°   | 387.5  | 412.6  | 421.3  | 421.3  | 418.0  |
| 102.5° | 516.3  | 534.8  | 546.8  | 550.2  | 546.8  |
| 105°   | 657.1  | 665.8  | 672.4  | 677.8  | 677.8  |
| 107.5° | 796.8  | 809.9  | 809.9  | 812.0  | 796.8  |
| 110°   | 932.2  | 949.6  | 949.6  | 949.6  | 940.9  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1078.4 | 1097.0 | 1093.7 | 1085.0 | 1078.4 |
| 115°   | 1222.5 | 1240.0 | 1234.5 | 1231.2 | 1222.5 |
| 117.5° | 1365.5 | 1389.5 | 1374.2 | 1365.5 | 1356.8 |
| 120°   | 1509.6 | 1533.6 | 1509.6 | 1509.6 | 1499.8 |
| 122.5° | 1640.6 | 1671.1 | 1655.9 | 1647.1 | 1640.6 |
| 125°   | 1778.1 | 1805.3 | 1796.7 | 1786.8 | 1783.5 |
| 127.5° | 1912.4 | 1946.2 | 1934.1 | 1921.1 | 1912.4 |
| 130°   | 2037.8 | 2077.1 | 2071.7 | 2065.1 | 2053.1 |
| 132.5° | 2178.6 | 2209.3 | 2211.4 | 2196.1 | 2187.4 |
| 135°   | 2299.8 | 2333.7 | 2340.3 | 2336.9 | 2328.2 |
| 137.5° | 2435.2 | 2462.5 | 2467.9 | 2465.7 | 2452.6 |
| 140°   | 2554.1 | 2581.4 | 2596.7 | 2596.7 | 2584.7 |
| 142.5° | 2676.4 | 2703.7 | 2712.4 | 2715.7 | 2703.7 |
| 145°   | 2792.1 | 2813.9 | 2831.4 | 2834.7 | 2822.7 |
| 147.5° | 2895.8 | 2923.1 | 2936.2 | 2941.7 | 2929.6 |
| 150°   | 3002.8 | 3021.3 | 3033.3 | 3043.2 | 3033.3 |
| 152.5° | 3097.7 | 3116.2 | 3131.6 | 3143.6 | 3131.6 |
| 155°   | 3192.7 | 3201.4 | 3211.3 | 3226.5 | 3216.7 |
| 157.5° | 3274.6 | 3281.1 | 3286.5 | 3308.4 | 3293.1 |
| 160°   | 3347.7 | 3354.3 | 3357.5 | 3376.1 | 3362.9 |
| 162.5° | 3415.3 | 3415.3 | 3418.7 | 3439.4 | 3424.1 |
| 165°   | 3473.2 | 3470.0 | 3470.0 | 3491.7 | 3476.5 |
| 167.5° | 3525.6 | 3515.8 | 3515.8 | 3537.6 | 3522.4 |
| 170°   | 3564.9 | 3556.1 | 3552.9 | 3574.7 | 3556.1 |
| 172.5° | 3592.2 | 3583.4 | 3580.2 | 3602.0 | 3583.4 |
| 175°   | 3614.0 | 3605.3 | 3598.8 | 3620.5 | 3602.0 |
| 177.5° | 3626.1 | 3617.3 | 3610.7 | 3629.3 | 3610.7 |
| 180°   | 3620.5 | 3620.5 | 3620.5 | 3620.5 | 3620.5 |

TEST NUMBER: P925964

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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 | 11.00            | 11.87 | 11.95 | 12.84 | 14.10 | 10.56          | 11.43 | 11.51 | 12.39 | 13.65 |
|                 | 3H   | 12.67            | 13.45 | 13.63 | 14.42 | 15.71 | 12.18          | 12.96 | 13.14 | 13.93 | 15.22 |
|                 | 4H   | 13.26            | 14.00 | 14.24 | 14.98 | 16.27 | 12.76          | 13.50 | 13.74 | 14.48 | 15.77 |
|                 | 6H   | 13.66            | 14.34 | 14.65 | 15.33 | 16.63 | 13.16          | 13.84 | 14.15 | 14.83 | 16.13 |
|                 | 8H   | 13.77            | 14.42 | 14.76 | 15.42 | 16.72 | 13.27          | 13.91 | 14.26 | 14.92 | 16.22 |
|                 | 12H  | 13.82            | 14.43 | 14.82 | 15.43 | 16.76 | 13.31          | 13.92 | 14.31 | 14.92 | 16.25 |
| 4H              | 2H   | 11.47            | 12.20 | 12.45 | 13.18 | 14.47 | 11.11          | 11.85 | 12.09 | 12.83 | 14.12 |
|                 | 3H   | 13.34            | 13.95 | 14.33 | 14.96 | 16.27 | 12.93          | 13.54 | 13.92 | 14.55 | 15.86 |
|                 | 4H   | 14.05            | 14.62 | 15.05 | 15.62 | 16.95 | 13.63          | 14.19 | 14.63 | 15.20 | 16.53 |
|                 | 6H   | 14.57            | 15.06 | 15.59 | 16.08 | 17.41 | 14.14          | 14.63 | 15.15 | 15.65 | 16.98 |
|                 | 8H   | 14.73            | 15.18 | 15.74 | 16.20 | 17.54 | 14.29          | 14.74 | 15.30 | 15.76 | 17.10 |
|                 | 12H  | 14.80            | 15.21 | 15.83 | 16.25 | 17.59 | 14.35          | 14.76 | 15.38 | 15.80 | 17.14 |
| 8H              | 4H   | 14.25            | 14.70 | 15.26 | 15.72 | 17.07 | 13.88          | 14.33 | 14.89 | 15.35 | 16.69 |
|                 | 6H   | 14.89            | 15.26 | 15.93 | 16.32 | 17.66 | 14.50          | 14.88 | 15.54 | 15.94 | 17.28 |
|                 | 8H   | 15.11            | 15.44 | 16.16 | 16.49 | 17.85 | 14.72          | 15.05 | 15.76 | 16.10 | 17.45 |
|                 | 12H  | 15.25            | 15.54 | 16.30 | 16.58 | 17.98 | 14.84          | 15.13 | 15.88 | 16.17 | 17.57 |
| 12H             | 4H   | 14.24            | 14.65 | 15.27 | 15.68 | 17.03 | 13.87          | 14.28 | 14.90 | 15.31 | 16.66 |
|                 | 6H   | 14.92            | 15.25 | 15.96 | 16.30 | 17.65 | 14.55          | 14.88 | 15.59 | 15.92 | 17.28 |
|                 | 8H   | 15.16            | 15.45 | 16.21 | 16.50 | 17.90 | 14.78          | 15.07 | 15.83 | 16.12 | 17.52 |

END OF REPORT