

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: P925991

Luminaire Tested: DFN2DIP-SQ4F0-120D090US950-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P925991  
REPORT IS A COMBINATION OF REPORTS P901646 AND P898471  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-120D090US950-RLLONL  
Description: 4 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

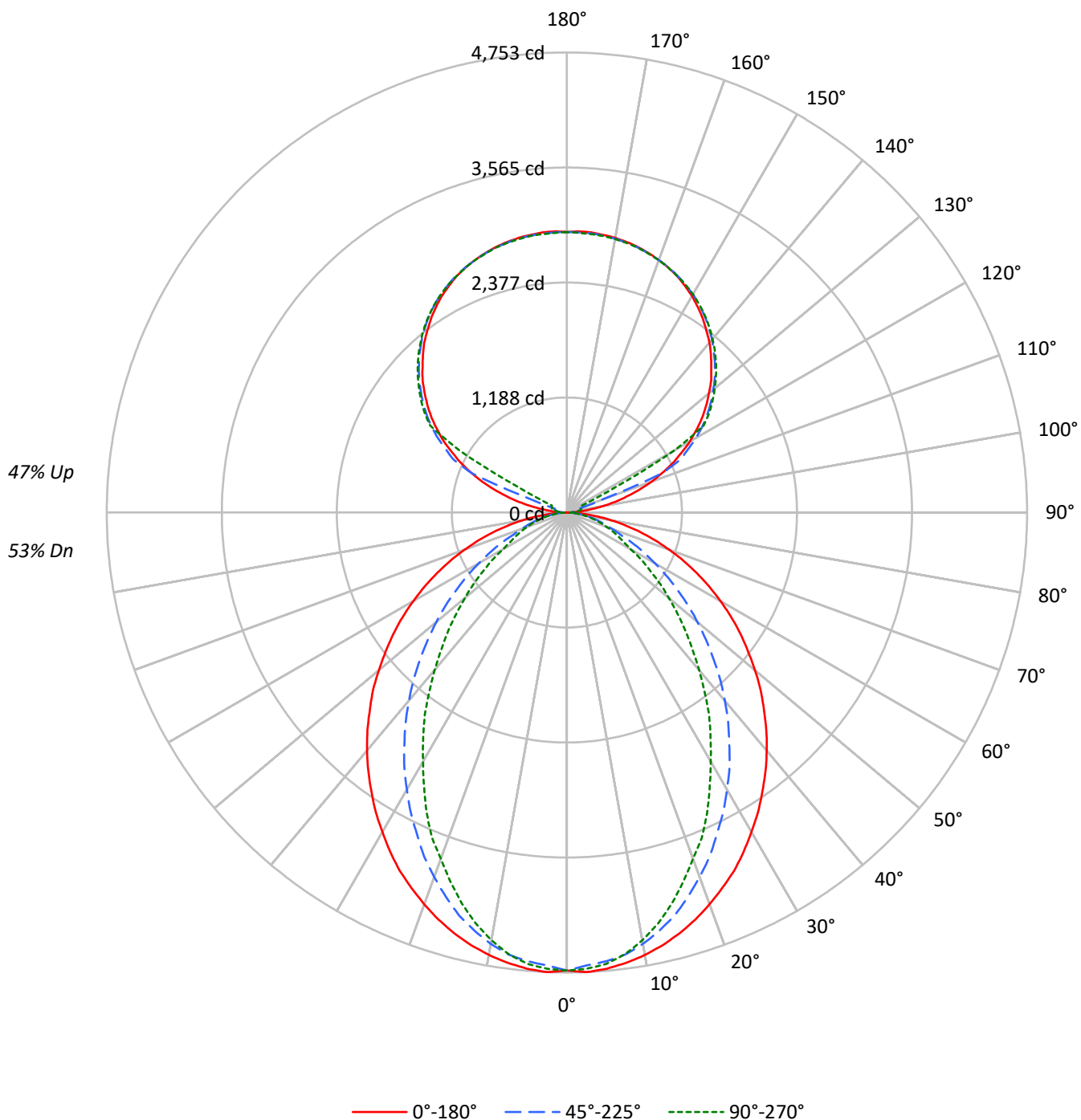
Lumens per Lamp: N/A  
Luminaire Lumens: 18230.9 lumens  
Efficiency: N/A  
Efficacy: 98.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 184.3  
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   | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 85 | 85 | 85 | 72 | 72 | 72 | 59 | 59 | 59 |
| 1   | 99  | 95  | 91  | 88  | 92  | 88  | 85  | 82  | 76 | 73 | 71 | 64 | 62 | 61 | 53 | 52 | 51 |
| 2   | 91  | 83  | 78  | 73  | 84  | 78  | 73  | 68  | 67 | 63 | 60 | 57 | 54 | 52 | 47 | 45 | 44 |
| 3   | 83  | 74  | 67  | 61  | 77  | 69  | 63  | 58  | 59 | 55 | 51 | 51 | 47 | 44 | 42 | 40 | 38 |
| 4   | 76  | 66  | 58  | 52  | 70  | 61  | 55  | 49  | 53 | 48 | 44 | 45 | 42 | 38 | 38 | 35 | 33 |
| 5   | 70  | 59  | 51  | 45  | 65  | 55  | 48  | 43  | 48 | 42 | 38 | 41 | 37 | 34 | 35 | 32 | 29 |
| 6   | 65  | 53  | 45  | 39  | 60  | 50  | 43  | 37  | 43 | 38 | 34 | 37 | 33 | 30 | 32 | 28 | 26 |
| 7   | 60  | 48  | 40  | 35  | 56  | 45  | 38  | 33  | 39 | 34 | 30 | 34 | 30 | 26 | 29 | 26 | 23 |
| 8   | 56  | 44  | 36  | 31  | 52  | 41  | 34  | 29  | 36 | 31 | 27 | 31 | 27 | 24 | 27 | 24 | 21 |
| 9   | 52  | 40  | 33  | 28  | 48  | 38  | 31  | 26  | 33 | 28 | 24 | 29 | 25 | 22 | 25 | 22 | 19 |
| 10  | 49  | 37  | 30  | 25  | 45  | 35  | 28  | 24  | 31 | 25 | 22 | 27 | 23 | 20 | 23 | 20 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3320 | 3320 | 3320 |
| 5°  | 3325 | 3268 | 3289 |
| 10° | 3292 | 3204 | 3183 |
| 15° | 3247 | 3099 | 3018 |
| 20° | 3187 | 2954 | 2816 |
| 25° | 3125 | 2791 | 2621 |
| 30° | 3043 | 2623 | 2373 |
| 35° | 2962 | 2443 | 2155 |
| 40° | 2880 | 2257 | 1905 |
| 45° | 2784 | 2051 | 1678 |
| 50° | 2686 | 1842 | 1456 |
| 55° | 2582 | 1619 | 1243 |
| 60° | 2463 | 1385 | 1024 |
| 65° | 2326 | 1148 | 923  |
| 70° | 2159 | 927  | 837  |
| 75° | 1950 | 819  | 763  |
| 80° | 1647 | 689  | 665  |
| 85° | 1147 | 463  | 507  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2784 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 443.4   | 2.4       |
| 10°-20°   | 1217.3  | 6.7       |
| 20°-30°   | 1709.1  | 9.4       |
| 30°-40°   | 1863.0  | 10.2      |
| 40°-50°   | 1712.3  | 9.4       |
| 50°-60°   | 1344.7  | 7.4       |
| 60°-70°   | 875.3   | 4.8       |
| 70°-80°   | 450.6   | 2.5       |
| 80°-90°   | 120.1   | 0.7       |
| 90°-100°  | 95.6    | 0.5       |
| 100°-110° | 356.2   | 2.0       |
| 110°-120° | 944.7   | 5.2       |
| 120°-130° | 1566.8  | 8.6       |
| 130°-140° | 1664.3  | 9.1       |
| 140°-150° | 1546.8  | 8.5       |
| 150°-160° | 1243.6  | 6.8       |
| 160°-170° | 801.3   | 4.4       |
| 170°-180° | 275.8   | 1.5       |
| 0°-30°    | 3369.8  | 18.5      |
| 0°-40°    | 5232.8  | 28.7      |
| 0°-60°    | 8289.9  | 45.5      |
| 0°-90°    | 9735.9  | 53.4      |
| 90°-120°  | 1396.4  | 7.7       |
| 90°-150°  | 6174.3  | 33.9      |
| 90°-180°  | 8495.0  | 46.6      |
| 0°-180°   | 18230.9 | 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    | 25    | 42   | 53    | 56   | 17   |
| 95°  | 136  | 67    | 82   | 92    | 90   | 161  |
| 105° | 637  | 700   | 128  | 151   | 159  | 681  |
| 115° | 1206 | 1241  | 1294 | 323   | 172  | 1187 |
| 125° | 1704 | 1732  | 1772 | 1786  | 1793 | 1520 |
| 135° | 2109 | 2143  | 2162 | 2183  | 2179 | 1629 |
| 145° | 2447 | 2445  | 2480 | 2495  | 2485 | 1530 |
| 155° | 2694 | 2676  | 2701 | 2713  | 2696 | 1242 |
| 165° | 2839 | 2826  | 2833 | 2847  | 2833 | 802  |
| 175° | 2904 | 2889  | 2894 | 2908  | 2887 | 276  |
| 180° | 2898 | 2898  | 2898 | 2898  | 2898 |      |

TEST NUMBER: P925991

CATALOG NUMBER: DFN2DIP-SQ4F0-120D090US950-RLLONL

**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°    | 2.0    | 25.2   | 41.8   | 52.6   | 56.5   |
| 92.5°  | 52.6   | 44.1   | 50.3   | 54.6   | 56.5   |
| 95°    | 136.2  | 67.0   | 81.7   | 92.3   | 90.2   |
| 97.5°  | 245.3  | 73.5   | 106.8  | 113.2  | 115.2  |
| 100°   | 371.2  | 84.0   | 119.5  | 136.2  | 140.4  |
| 102.5° | 509.4  | 505.4  | 123.7  | 146.6  | 153.1  |
| 105°   | 637.4  | 700.4  | 127.9  | 150.9  | 159.3  |
| 107.5° | 786.3  | 838.6  | 132.2  | 155.1  | 163.6  |
| 110°   | 928.9  | 972.8  | 367.0  | 157.3  | 165.6  |

TEST NUMBER: P925991

CATALOG NUMBER: DFN2DIP-SQ4F0-120D090US950-RLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1063.1 | 1100.7 | 1065.1 | 161.3  | 167.8  |
| 115°   | 1205.6 | 1241.2 | 1293.7 | 322.9  | 172.0  |
| 117.5° | 1329.3 | 1371.2 | 1407.0 | 1107.0 | 557.7  |
| 120°   | 1467.7 | 1499.1 | 1537.0 | 1562.1 | 1279.0 |
| 122.5° | 1585.1 | 1618.7 | 1660.7 | 1673.1 | 1675.4 |
| 125°   | 1704.5 | 1731.9 | 1771.8 | 1786.5 | 1792.7 |
| 127.5° | 1813.6 | 1842.9 | 1874.6 | 1895.5 | 1897.5 |
| 130°   | 1916.4 | 1950.1 | 1973.0 | 1996.1 | 1994.1 |
| 132.5° | 2021.2 | 2048.6 | 2071.5 | 2090.5 | 2088.5 |
| 135°   | 2109.4 | 2143.0 | 2161.7 | 2182.8 | 2178.6 |
| 137.5° | 2201.5 | 2226.6 | 2247.8 | 2268.7 | 2262.5 |
| 140°   | 2291.6 | 2308.6 | 2331.5 | 2350.4 | 2340.0 |
| 142.5° | 2367.4 | 2382.0 | 2409.1 | 2425.8 | 2415.4 |
| 145°   | 2447.0 | 2444.7 | 2480.4 | 2495.1 | 2484.6 |
| 147.5° | 2516.0 | 2509.8 | 2545.4 | 2555.9 | 2547.6 |
| 150°   | 2583.2 | 2568.5 | 2602.1 | 2614.5 | 2604.1 |
| 152.5° | 2639.7 | 2623.0 | 2654.4 | 2667.1 | 2652.4 |
| 155°   | 2694.3 | 2675.6 | 2700.7 | 2713.2 | 2696.5 |
| 157.5° | 2738.4 | 2721.7 | 2740.6 | 2755.2 | 2738.4 |
| 160°   | 2776.1 | 2763.5 | 2776.1 | 2788.6 | 2773.9 |
| 162.5° | 2809.5 | 2797.0 | 2807.5 | 2822.2 | 2803.3 |
| 165°   | 2838.9 | 2826.4 | 2832.7 | 2847.4 | 2832.7 |
| 167.5° | 2862.1 | 2849.4 | 2855.8 | 2870.5 | 2851.6 |
| 170°   | 2881.0 | 2868.3 | 2872.5 | 2887.2 | 2868.3 |
| 172.5° | 2893.5 | 2881.0 | 2885.2 | 2899.9 | 2881.0 |
| 175°   | 2903.9 | 2889.2 | 2893.5 | 2908.1 | 2887.2 |
| 177.5° | 2908.1 | 2893.5 | 2895.7 | 2910.4 | 2891.5 |
| 180°   | 2897.7 | 2897.7 | 2897.7 | 2897.7 | 2897.7 |

TEST NUMBER: P925991

CATALOG NUMBER: DFN2DIP-SQ4F0-120D090US950-RLONL

**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 | 11.64            | 12.50 | 12.58 | 13.45 | 14.67 | 7.60           | 8.46  | 8.54  | 9.41  | 10.63 |
|                 | 3H   | 13.33            | 14.09 | 14.27 | 15.05 | 16.30 | 8.79           | 9.56  | 9.74  | 10.52 | 11.77 |
|                 | 4H   | 13.94            | 14.66 | 14.90 | 15.62 | 16.88 | 9.25           | 9.97  | 10.21 | 10.93 | 12.19 |
|                 | 6H   | 14.37            | 15.03 | 15.34 | 16.00 | 17.27 | 9.57           | 10.24 | 10.54 | 11.20 | 12.47 |
|                 | 8H   | 14.49            | 15.13 | 15.47 | 16.11 | 17.38 | 9.66           | 10.30 | 10.64 | 11.28 | 12.54 |
|                 | 12H  | 14.56            | 15.16 | 15.54 | 16.14 | 17.43 | 9.70           | 10.31 | 10.69 | 11.29 | 12.58 |
| 4H              | 2H   | 11.66            | 12.39 | 12.63 | 13.35 | 14.61 | 8.20           | 8.93  | 9.17  | 9.89  | 11.15 |
|                 | 3H   | 13.50            | 14.10 | 14.48 | 15.09 | 16.36 | 9.56           | 10.16 | 10.53 | 11.15 | 12.42 |
|                 | 4H   | 14.20            | 14.75 | 15.18 | 15.73 | 17.03 | 10.11          | 10.66 | 11.09 | 11.64 | 12.94 |
|                 | 6H   | 14.72            | 15.19 | 15.71 | 16.20 | 17.49 | 10.53          | 11.00 | 11.52 | 12.01 | 13.30 |
|                 | 8H   | 14.90            | 15.34 | 15.89 | 16.34 | 17.65 | 10.66          | 11.10 | 11.66 | 12.10 | 13.41 |
|                 | 12H  | 14.99            | 15.39 | 16.01 | 16.41 | 17.72 | 10.73          | 11.12 | 11.74 | 12.14 | 13.45 |
| 8H              | 4H   | 14.17            | 14.61 | 15.16 | 15.61 | 16.92 | 10.39          | 10.83 | 11.39 | 11.83 | 13.14 |
|                 | 6H   | 14.74            | 15.10 | 15.76 | 16.15 | 17.45 | 10.91          | 11.28 | 11.93 | 12.32 | 13.63 |
|                 | 8H   | 14.96            | 15.28 | 15.99 | 16.31 | 17.63 | 11.10          | 11.43 | 12.13 | 12.45 | 13.78 |
|                 | 12H  | 15.10            | 15.38 | 16.13 | 16.41 | 17.78 | 11.23          | 11.51 | 12.26 | 12.53 | 13.90 |
| 12H             | 4H   | 14.12            | 14.52 | 15.14 | 15.53 | 16.85 | 10.40          | 10.80 | 11.41 | 11.81 | 13.13 |
|                 | 6H   | 14.71            | 15.04 | 15.74 | 16.06 | 17.39 | 10.96          | 11.28 | 11.99 | 12.31 | 13.64 |
|                 | 8H   | 14.94            | 15.22 | 15.97 | 16.24 | 17.61 | 11.18          | 11.46 | 12.21 | 12.48 | 13.85 |

END OF REPORT