

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: P912289

Luminaire Tested: DFN2DIP-SQ4F0-100D120US850-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P912289  
REPORT IS A COMBINATION OF REPORTS P901695 AND P898471  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-100D120US850-FLLONL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

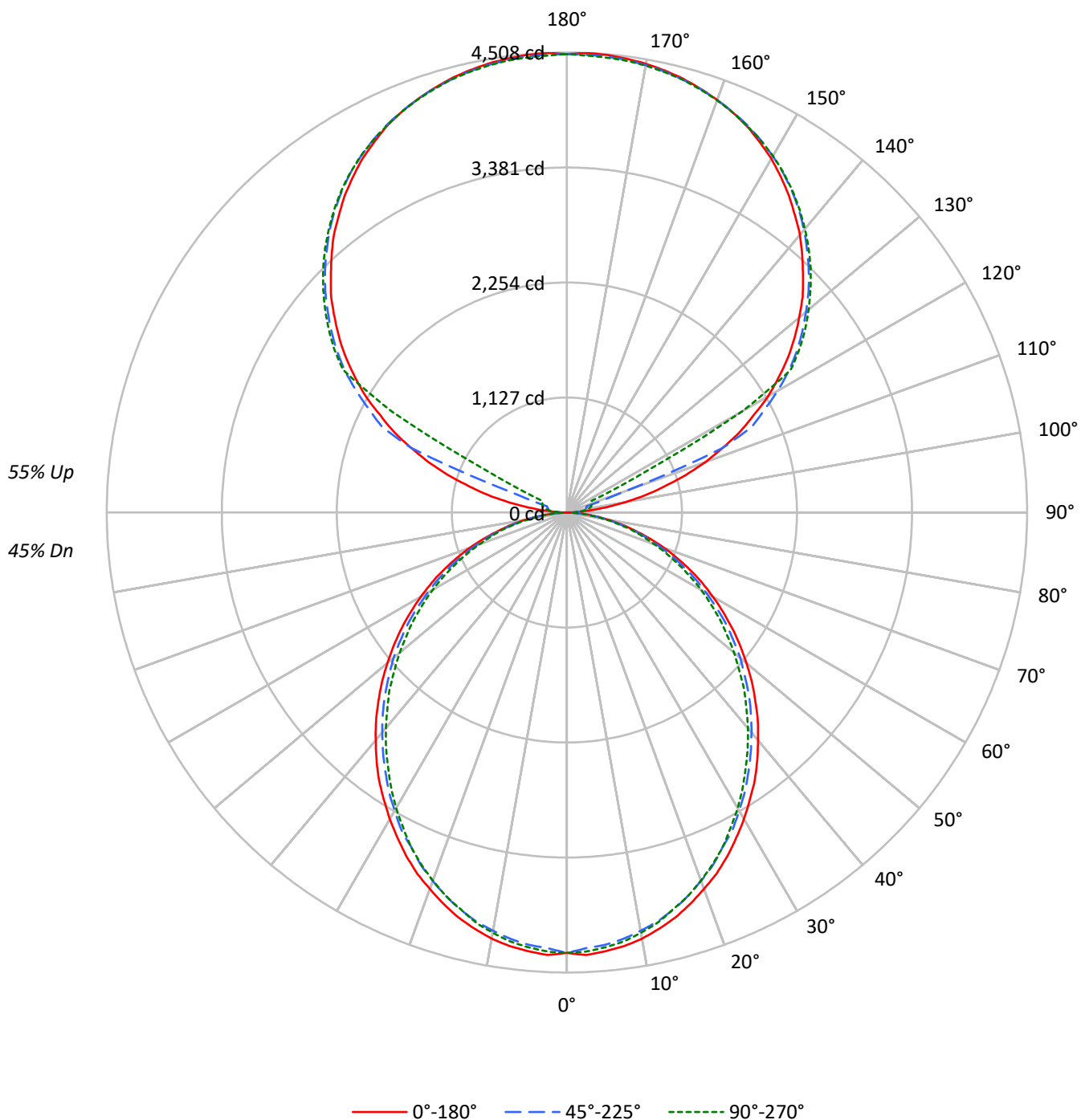
Lumens per Lamp: N/A  
Luminaire Lumens: 24154.0 lumens  
Efficiency: N/A  
Efficacy: 132.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 182.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9968  
Total Harmonic Distortion (THDi): 0.064  
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   | 106 | 106 | 106 | 106 | 97 | 97 | 97 | 97 | 81 | 81 | 81 | 66 | 66 | 66 | 52 | 52 | 52 |
| 1   | 97  | 92  | 89  | 85  | 89 | 85 | 82 | 79 | 71 | 68 | 66 | 58 | 56 | 55 | 46 | 45 | 44 |
| 2   | 88  | 81  | 75  | 70  | 81 | 74 | 69 | 65 | 62 | 58 | 55 | 51 | 48 | 46 | 40 | 39 | 37 |
| 3   | 80  | 71  | 64  | 58  | 73 | 65 | 59 | 54 | 55 | 50 | 46 | 45 | 42 | 39 | 36 | 33 | 31 |
| 4   | 74  | 63  | 55  | 49  | 67 | 58 | 51 | 46 | 49 | 43 | 39 | 40 | 36 | 33 | 32 | 29 | 27 |
| 5   | 67  | 56  | 48  | 42  | 62 | 52 | 45 | 39 | 43 | 38 | 34 | 36 | 32 | 29 | 29 | 26 | 24 |
| 6   | 62  | 50  | 42  | 36  | 57 | 46 | 39 | 34 | 39 | 34 | 30 | 32 | 28 | 25 | 26 | 23 | 21 |
| 7   | 57  | 45  | 37  | 32  | 53 | 42 | 35 | 30 | 35 | 30 | 26 | 30 | 25 | 22 | 24 | 21 | 18 |
| 8   | 53  | 41  | 33  | 28  | 49 | 38 | 31 | 26 | 32 | 27 | 23 | 27 | 23 | 20 | 22 | 19 | 17 |
| 9   | 50  | 37  | 30  | 25  | 45 | 35 | 28 | 24 | 30 | 24 | 21 | 25 | 21 | 18 | 20 | 17 | 15 |
| 10  | 46  | 34  | 27  | 22  | 42 | 32 | 25 | 21 | 27 | 22 | 19 | 23 | 19 | 16 | 19 | 16 | 14 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3028 | 3028 | 3028 |
| 5°  | 3033 | 2986 | 3007 |
| 10° | 3008 | 2947 | 2967 |
| 15° | 2964 | 2899 | 2904 |
| 20° | 2904 | 2832 | 2840 |
| 25° | 2845 | 2752 | 2765 |
| 30° | 2770 | 2677 | 2670 |
| 35° | 2699 | 2590 | 2570 |
| 40° | 2612 | 2501 | 2475 |
| 45° | 2526 | 2412 | 2377 |
| 50° | 2431 | 2319 | 2264 |
| 55° | 2332 | 2211 | 2160 |
| 60° | 2219 | 2083 | 2041 |
| 65° | 2097 | 1950 | 1901 |
| 70° | 1941 | 1789 | 1750 |
| 75° | 1725 | 1595 | 1613 |
| 80° | 1465 | 1349 | 1347 |
| 85° | 1059 | 923  | 906  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 2526 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 406.1   | 1.7       |
| 10°-20°   | 1142.7  | 4.7       |
| 20°-30°   | 1679.4  | 7.0       |
| 30°-40°   | 1950.5  | 8.1       |
| 40°-50°   | 1948.1  | 8.1       |
| 50°-60°   | 1698.7  | 7.0       |
| 60°-70°   | 1255.7  | 5.2       |
| 70°-80°   | 710.4   | 2.9       |
| 80°-90°   | 195.4   | 0.8       |
| 90°-100°  | 148.1   | 0.6       |
| 100°-110° | 552.1   | 2.3       |
| 110°-120° | 1464.2  | 6.1       |
| 120°-130° | 2428.5  | 10.1      |
| 130°-140° | 2579.6  | 10.7      |
| 140°-150° | 2397.5  | 9.9       |
| 150°-160° | 1927.5  | 8.0       |
| 160°-170° | 1242.0  | 5.1       |
| 170°-180° | 427.5   | 1.8       |
| 0°-30°    | 3228.3  | 13.4      |
| 0°-40°    | 5178.7  | 21.4      |
| 0°-60°    | 8825.5  | 36.5      |
| 0°-90°    | 10987.0 | 45.5      |
| 90°-120°  | 2164.4  | 9.0       |
| 90°-150°  | 9570.0  | 39.6      |
| 90°-180°  | 13167.0 | 54.5      |
| 0°-180°   | 24154.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4315 | 4315  | 4315 | 4315  | 4315 |      |
| 5°   | 4315 | 4299  | 4253 | 4286  | 4278 | 410  |
| 15°  | 4108 | 4083  | 4029 | 4046  | 4025 | 1157 |
| 25°  | 3718 | 3685  | 3614 | 3622  | 3614 | 1711 |
| 35°  | 3208 | 3166  | 3100 | 3075  | 3054 | 2003 |
| 45°  | 2610 | 2581  | 2518 | 2473  | 2456 | 2014 |
| 55°  | 1975 | 1950  | 1900 | 1851  | 1830 | 1766 |
| 65°  | 1332 | 1307  | 1266 | 1228  | 1208 | 1317 |
| 75°  | 697  | 689   | 668  | 643   | 652  | 744  |
| 85°  | 170  | 166   | 162  | 149   | 145  | 190  |
| 90°  | 3    | 39    | 65   | 81    | 88   | 22   |
| 95°  | 211  | 104   | 126  | 143   | 140  | 250  |
| 105° | 988  | 1086  | 198  | 234   | 247  | 1056 |
| 115° | 1869 | 1924  | 2005 | 500   | 267  | 1840 |
| 125° | 2642 | 2684  | 2746 | 2769  | 2779 | 2356 |
| 135° | 3269 | 3322  | 3350 | 3383  | 3377 | 2526 |
| 145° | 3793 | 3789  | 3844 | 3867  | 3851 | 2372 |
| 155° | 4176 | 4147  | 4186 | 4205  | 4180 | 1924 |
| 165° | 4400 | 4381  | 4390 | 4413  | 4390 | 1243 |
| 175° | 4501 | 4478  | 4485 | 4508  | 4475 | 428  |
| 180° | 4491 | 4491  | 4491 | 4491  | 4491 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4315.2 | 4315.2 | 4315.2 | 4315.2 | 4315.2 |
| 2.5°   | 4340.3 | 4319.6 | 4273.8 | 4315.2 | 4307.2 |
| 5°     | 4315.2 | 4298.9 | 4253.1 | 4286.2 | 4278.2 |
| 7.5°   | 4286.2 | 4261.4 | 4215.6 | 4249.1 | 4240.8 |
| 10°    | 4240.8 | 4211.8 | 4162.0 | 4195.0 | 4182.7 |
| 12.5°  | 4178.3 | 4153.6 | 4103.9 | 4124.6 | 4116.2 |
| 15°    | 4107.8 | 4083.2 | 4029.0 | 4045.7 | 4025.1 |
| 17.5°  | 4020.7 | 3996.1 | 3941.8 | 3962.6 | 3941.8 |
| 20°    | 3925.1 | 3900.5 | 3842.4 | 3854.7 | 3838.4 |
| 22.5°  | 3830.0 | 3792.7 | 3738.4 | 3738.4 | 3730.1 |
| 25°    | 3717.8 | 3684.8 | 3614.3 | 3622.2 | 3614.3 |
| 27.5°  | 3593.2 | 3564.1 | 3510.4 | 3498.1 | 3477.4 |
| 30°    | 3469.1 | 3435.6 | 3373.5 | 3361.2 | 3344.4 |
| 32.5°  | 3336.1 | 3311.5 | 3244.9 | 3219.9 | 3203.1 |
| 35°    | 3207.6 | 3166.2 | 3099.7 | 3074.6 | 3053.9 |
| 37.5°  | 3062.3 | 3024.8 | 2958.4 | 2929.3 | 2908.6 |
| 40°    | 2913.0 | 2879.5 | 2813.1 | 2776.2 | 2759.4 |
| 42.5°  | 2767.7 | 2734.2 | 2668.3 | 2626.4 | 2601.8 |
| 45°    | 2610.1 | 2581.1 | 2518.5 | 2473.2 | 2456.5 |
| 47.5°  | 2456.5 | 2427.5 | 2361.0 | 2315.1 | 2290.5 |
| 50°    | 2294.5 | 2273.8 | 2215.7 | 2157.6 | 2136.9 |
| 52.5°  | 2136.9 | 2107.9 | 2054.1 | 2008.4 | 1979.3 |
| 55°    | 1975.4 | 1950.3 | 1900.5 | 1850.7 | 1830.1 |
| 57.5°  | 1813.3 | 1792.6 | 1738.5 | 1688.8 | 1672.0 |
| 60°    | 1651.3 | 1635.0 | 1576.9 | 1531.1 | 1518.8 |
| 62.5°  | 1493.7 | 1464.7 | 1423.3 | 1381.9 | 1365.2 |
| 65°    | 1332.1 | 1307.1 | 1265.7 | 1228.2 | 1207.6 |
| 67.5°  | 1166.2 | 1145.0 | 1108.1 | 1079.1 | 1062.3 |
| 70°    | 1012.5 | 995.8  | 958.4  | 929.3  | 913.0  |
| 72.5°  | 854.9  | 838.2  | 817.6  | 788.5  | 776.1  |
| 75°    | 696.9  | 689.0  | 667.8  | 643.2  | 651.5  |
| 77.5°  | 556.1  | 539.3  | 530.9  | 518.6  | 506.3  |
| 80°    | 415.1  | 410.8  | 402.3  | 390.0  | 381.7  |
| 82.5°  | 282.2  | 282.2  | 278.2  | 261.5  | 261.5  |
| 85°    | 169.9  | 166.0  | 162.0  | 149.3  | 145.3  |
| 87.5°  | 74.9   | 66.4   | 58.1   | 45.8   | 41.4   |
| 90°    | 3.1    | 38.9   | 64.9   | 81.4   | 87.6   |
| 92.5°  | 81.4   | 68.3   | 78.0   | 84.5   | 87.6   |
| 95°    | 211.0  | 103.8  | 126.5  | 143.2  | 139.7  |
| 97.5°  | 380.2  | 113.9  | 165.6  | 175.6  | 178.7  |
| 100°   | 575.3  | 130.1  | 185.2  | 211.0  | 217.7  |
| 102.5° | 789.6  | 783.4  | 191.7  | 227.3  | 237.3  |
| 105°   | 987.9  | 1085.6 | 198.4  | 233.9  | 247.0  |
| 107.5° | 1218.7 | 1299.7 | 204.9  | 240.4  | 253.5  |
| 110°   | 1439.8 | 1507.8 | 568.8  | 243.9  | 256.6  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1647.9 | 1706.1 | 1651.0 | 250.1  | 260.1  |
| 115°   | 1868.6 | 1923.8 | 2005.2 | 500.5  | 266.7  |
| 117.5° | 2060.4 | 2125.3 | 2180.8 | 1715.7 | 864.5  |
| 120°   | 2275.0 | 2323.6 | 2382.2 | 2421.3 | 1982.4 |
| 122.5° | 2456.8 | 2508.9 | 2574.1 | 2593.4 | 2596.8 |
| 125°   | 2642.0 | 2684.4 | 2746.2 | 2769.0 | 2778.6 |
| 127.5° | 2811.0 | 2856.6 | 2905.6 | 2938.0 | 2941.1 |
| 130°   | 2970.3 | 3022.5 | 3058.0 | 3093.9 | 3090.8 |
| 132.5° | 3132.8 | 3175.3 | 3210.8 | 3240.2 | 3237.1 |
| 135°   | 3269.4 | 3321.6 | 3350.5 | 3383.3 | 3376.8 |
| 137.5° | 3412.3 | 3451.2 | 3484.0 | 3516.4 | 3506.8 |
| 140°   | 3552.0 | 3578.2 | 3613.7 | 3643.1 | 3626.9 |
| 142.5° | 3669.2 | 3692.1 | 3734.1 | 3760.0 | 3743.8 |
| 145°   | 3792.8 | 3789.3 | 3844.5 | 3867.3 | 3851.0 |
| 147.5° | 3899.7 | 3890.0 | 3945.3 | 3961.5 | 3948.7 |
| 150°   | 4003.8 | 3981.1 | 4033.2 | 4052.5 | 4036.3 |
| 152.5° | 4091.4 | 4065.6 | 4114.3 | 4133.9 | 4111.2 |
| 155°   | 4175.9 | 4147.0 | 4186.0 | 4205.3 | 4179.5 |
| 157.5° | 4244.3 | 4218.4 | 4247.8 | 4270.5 | 4244.3 |
| 160°   | 4302.9 | 4283.3 | 4302.9 | 4322.2 | 4299.5 |
| 162.5° | 4354.7 | 4335.4 | 4351.6 | 4374.3 | 4345.1 |
| 165°   | 4400.2 | 4380.9 | 4390.5 | 4413.4 | 4390.5 |
| 167.5° | 4436.1 | 4416.4 | 4426.5 | 4449.2 | 4419.9 |
| 170°   | 4465.4 | 4445.8 | 4452.3 | 4475.0 | 4445.8 |
| 172.5° | 4484.7 | 4465.4 | 4472.0 | 4494.8 | 4465.4 |
| 175°   | 4500.9 | 4478.1 | 4484.7 | 4507.5 | 4475.0 |
| 177.5° | 4507.5 | 4484.7 | 4488.2 | 4511.0 | 4481.7 |
| 180°   | 4491.3 | 4491.3 | 4491.3 | 4491.3 | 4491.3 |

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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 | 10.70            | 11.52 | 11.70 | 12.53 | 13.86 | 10.26          | 11.08 | 11.25 | 12.09 | 13.42 |
|                 | 3H   | 12.36            | 13.10 | 13.37 | 14.12 | 15.47 | 11.87          | 12.61 | 12.88 | 13.63 | 14.98 |
|                 | 4H   | 12.95            | 13.65 | 13.97 | 14.67 | 16.03 | 12.46          | 13.16 | 13.48 | 14.17 | 15.54 |
|                 | 6H   | 13.35            | 14.00 | 14.38 | 15.02 | 16.39 | 12.85          | 13.50 | 13.88 | 14.52 | 15.89 |
|                 | 8H   | 13.46            | 14.07 | 14.49 | 15.11 | 16.48 | 12.96          | 13.57 | 13.99 | 14.61 | 15.98 |
|                 | 12H  | 13.51            | 14.09 | 14.55 | 15.12 | 16.52 | 13.00          | 13.58 | 14.04 | 14.61 | 16.01 |
| 4H              | 2H   | 11.16            | 11.86 | 12.18 | 12.87 | 14.24 | 10.80          | 11.50 | 11.83 | 12.52 | 13.88 |
|                 | 3H   | 13.03            | 13.61 | 14.06 | 14.65 | 16.03 | 12.62          | 13.20 | 13.65 | 14.25 | 15.62 |
|                 | 4H   | 13.74            | 14.27 | 14.78 | 15.31 | 16.71 | 13.32          | 13.85 | 14.36 | 14.89 | 16.29 |
|                 | 6H   | 14.26            | 14.72 | 15.31 | 15.78 | 17.17 | 13.83          | 14.29 | 14.88 | 15.35 | 16.74 |
|                 | 8H   | 14.41            | 14.84 | 15.46 | 15.89 | 17.30 | 13.97          | 14.40 | 15.02 | 15.46 | 16.87 |
|                 | 12H  | 14.48            | 14.87 | 15.55 | 15.94 | 17.35 | 14.03          | 14.42 | 15.10 | 15.49 | 16.91 |
| 8H              | 4H   | 13.94            | 14.36 | 14.99 | 15.42 | 16.83 | 13.56          | 13.99 | 14.61 | 15.04 | 16.45 |
|                 | 6H   | 14.57            | 14.92 | 15.64 | 16.02 | 17.43 | 14.19          | 14.54 | 15.26 | 15.64 | 17.04 |
|                 | 8H   | 14.79            | 15.10 | 15.87 | 16.18 | 17.61 | 14.40          | 14.71 | 15.48 | 15.79 | 17.22 |
|                 | 12H  | 14.93            | 15.20 | 16.01 | 16.28 | 17.74 | 14.51          | 14.79 | 15.60 | 15.86 | 17.33 |
| 12H             | 4H   | 13.92            | 14.31 | 14.99 | 15.38 | 16.79 | 13.55          | 13.94 | 14.62 | 15.01 | 16.42 |
|                 | 6H   | 14.60            | 14.91 | 15.68 | 15.99 | 17.42 | 14.23          | 14.54 | 15.31 | 15.62 | 17.05 |
|                 | 8H   | 14.84            | 15.12 | 15.93 | 16.19 | 17.66 | 14.46          | 14.74 | 15.55 | 15.81 | 17.28 |

END OF REPORT