

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: P912315

Luminaire Tested: DFN2DIP-SQ4F0-110D090US850-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P912315  
REPORT IS A COMBINATION OF REPORTS P901644 AND P898471  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-110D090US850-RLLONL  
Description: 4 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

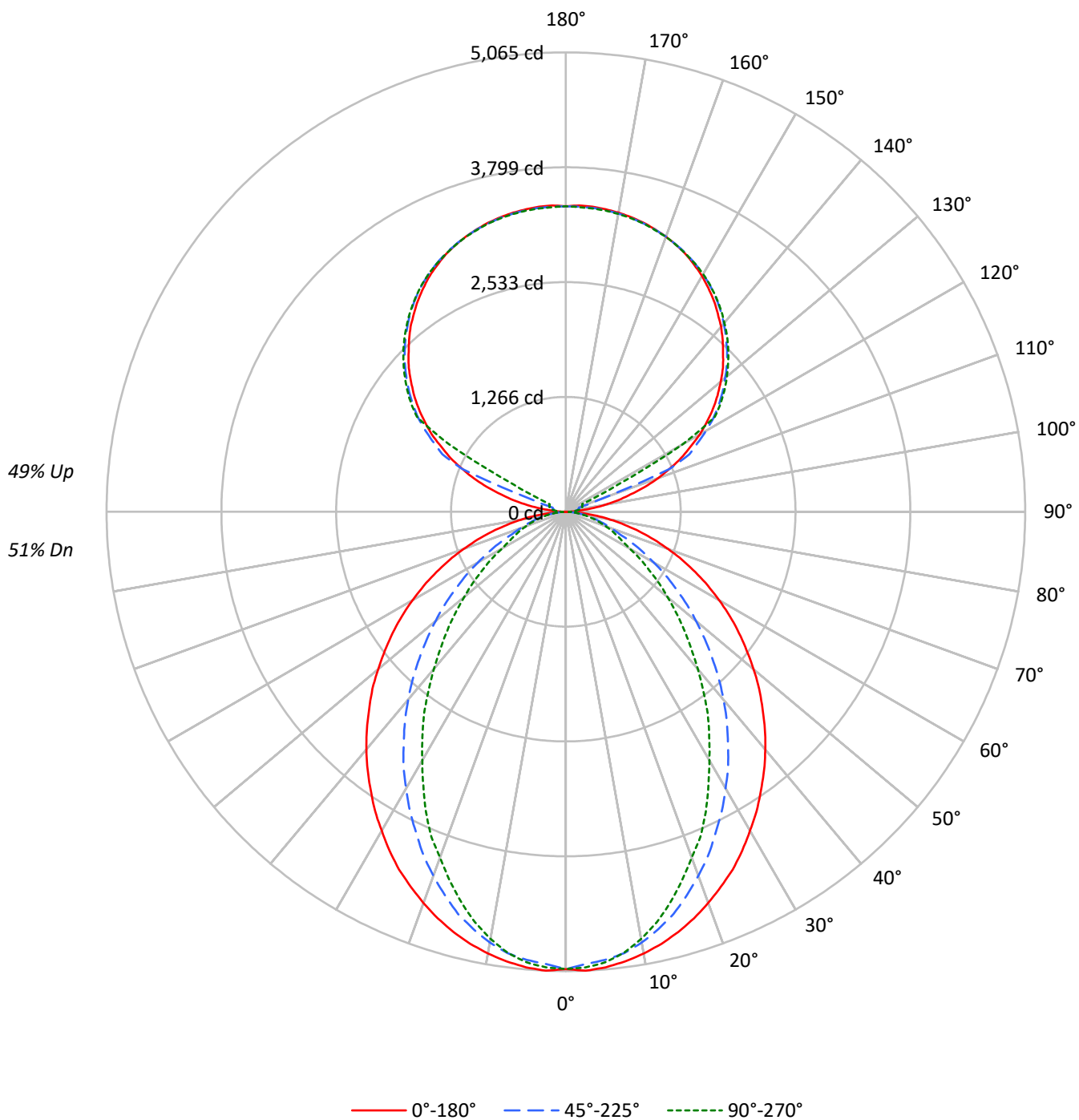
Lumens per Lamp: N/A  
Luminaire Lumens: 20250.3 lumens  
Efficiency: N/A  
Efficacy: 117.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 171.8  
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

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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 | 84 | 84 | 84 | 70 | 70 | 70 | 57 | 57 | 57 |
| 1   | 99  | 94  | 91  | 87  | 91 | 87 | 84 | 81 | 74 | 72 | 70 | 62 | 61 | 59 | 51 | 50 | 49 |
| 2   | 90  | 83  | 77  | 72  | 83 | 77 | 72 | 68 | 66 | 62 | 59 | 55 | 53 | 50 | 46 | 44 | 42 |
| 3   | 83  | 73  | 66  | 61  | 76 | 68 | 62 | 57 | 58 | 54 | 50 | 49 | 46 | 43 | 41 | 39 | 37 |
| 4   | 76  | 65  | 58  | 52  | 70 | 61 | 54 | 49 | 52 | 47 | 43 | 44 | 41 | 37 | 37 | 34 | 32 |
| 5   | 70  | 58  | 51  | 45  | 64 | 54 | 48 | 42 | 47 | 42 | 37 | 40 | 36 | 33 | 34 | 31 | 28 |
| 6   | 64  | 53  | 45  | 39  | 59 | 49 | 42 | 37 | 43 | 37 | 33 | 36 | 32 | 29 | 31 | 27 | 25 |
| 7   | 60  | 48  | 40  | 34  | 55 | 45 | 38 | 33 | 39 | 33 | 29 | 33 | 29 | 26 | 28 | 25 | 22 |
| 8   | 55  | 43  | 36  | 31  | 51 | 41 | 34 | 29 | 35 | 30 | 26 | 31 | 26 | 23 | 26 | 23 | 20 |
| 9   | 52  | 40  | 32  | 27  | 48 | 37 | 31 | 26 | 33 | 27 | 24 | 28 | 24 | 21 | 24 | 21 | 18 |
| 10  | 48  | 37  | 29  | 25  | 45 | 34 | 28 | 24 | 30 | 25 | 21 | 26 | 22 | 19 | 22 | 19 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3538 | 3538 | 3538 |
| 5°  | 3543 | 3482 | 3505 |
| 10° | 3508 | 3415 | 3392 |
| 15° | 3460 | 3303 | 3216 |
| 20° | 3396 | 3148 | 3001 |
| 25° | 3330 | 2974 | 2793 |
| 30° | 3243 | 2796 | 2528 |
| 35° | 3156 | 2604 | 2296 |
| 40° | 3069 | 2405 | 2029 |
| 45° | 2967 | 2185 | 1788 |
| 50° | 2862 | 1963 | 1552 |
| 55° | 2752 | 1725 | 1325 |
| 60° | 2624 | 1476 | 1092 |
| 65° | 2478 | 1223 | 984  |
| 70° | 2301 | 988  | 892  |
| 75° | 2078 | 872  | 814  |
| 80° | 1755 | 734  | 709  |
| 85° | 1222 | 494  | 540  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2967 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 472.5   | 2.3       |
| 10°-20°   | 1297.2  | 6.4       |
| 20°-30°   | 1821.2  | 9.0       |
| 30°-40°   | 1985.2  | 9.8       |
| 40°-50°   | 1824.6  | 9.0       |
| 50°-60°   | 1433.0  | 7.1       |
| 60°-70°   | 932.7   | 4.6       |
| 70°-80°   | 480.1   | 2.4       |
| 80°-90°   | 128.5   | 0.6       |
| 90°-100°  | 111.1   | 0.5       |
| 100°-110° | 414.0   | 2.0       |
| 110°-120° | 1098.2  | 5.4       |
| 120°-130° | 1821.4  | 9.0       |
| 130°-140° | 1934.7  | 9.6       |
| 140°-150° | 1798.1  | 8.9       |
| 150°-160° | 1445.6  | 7.1       |
| 160°-170° | 931.5   | 4.6       |
| 170°-180° | 320.6   | 1.6       |
| 0°-30°    | 3590.9  | 17.7      |
| 0°-40°    | 5576.1  | 27.5      |
| 0°-60°    | 8833.7  | 43.6      |
| 0°-90°    | 10375.1 | 51.2      |
| 90°-120°  | 1623.3  | 8.0       |
| 90°-150°  | 7177.5  | 35.4      |
| 90°-180°  | 9875.0  | 48.8      |
| 0°-180°   | 20250.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 5042 | 5042  | 5042 | 5042  | 5042 |      |
| 5°   | 5042 | 5019  | 4960 | 5001  | 4987 | 478  |
| 15°  | 4795 | 4745  | 4590 | 4504  | 4458 | 1351 |
| 25°  | 4353 | 4207  | 3906 | 3719  | 3650 | 2002 |
| 35°  | 3751 | 3518  | 3117 | 2829  | 2728 | 2348 |
| 45°  | 3066 | 2760  | 2282 | 1957  | 1848 | 2368 |
| 55°  | 2331 | 1976  | 1483 | 1209  | 1123 | 2083 |
| 65°  | 1574 | 1204  | 794  | 639   | 625  | 1561 |
| 75°  | 839  | 520   | 365  | 333   | 329  | 888  |
| 85°  | 196  | 100   | 87   | 87    | 87   | 225  |
| 90°  | 2    | 29    | 49   | 61    | 66   | 19   |
| 95°  | 158  | 78    | 95   | 107   | 105  | 188  |
| 105° | 741  | 814   | 149  | 175   | 185  | 792  |
| 115° | 1401 | 1443  | 1504 | 375   | 200  | 1380 |
| 125° | 1982 | 2013  | 2060 | 2077  | 2084 | 1767 |
| 135° | 2452 | 2491  | 2513 | 2538  | 2533 | 1894 |
| 145° | 2845 | 2842  | 2883 | 2900  | 2888 | 1779 |
| 155° | 3132 | 3110  | 3140 | 3154  | 3135 | 1443 |
| 165° | 3300 | 3286  | 3293 | 3310  | 3293 | 932  |
| 175° | 3376 | 3359  | 3364 | 3381  | 3356 | 321  |
| 180° | 3368 | 3368  | 3368 | 3368  | 3368 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 5041.8 | 5041.8 | 5041.8 | 5041.8 | 5041.8 |
| 2.5°   | 5064.6 | 5041.8 | 4991.5 | 5037.5 | 5028.3 |
| 5°     | 5041.8 | 5019.1 | 4959.6 | 5000.7 | 4987.2 |
| 7.5°   | 5000.7 | 4973.5 | 4909.7 | 4927.6 | 4904.8 |
| 10°    | 4946.0 | 4914.0 | 4823.0 | 4809.0 | 4781.9 |
| 12.5°  | 4877.7 | 4836.6 | 4713.1 | 4686.0 | 4635.6 |
| 15°    | 4795.4 | 4745.1 | 4590.2 | 4503.5 | 4458.0 |
| 17.5°  | 4699.6 | 4626.5 | 4434.8 | 4334.5 | 4261.4 |
| 20°    | 4590.2 | 4498.7 | 4270.6 | 4156.9 | 4056.2 |
| 22.5°  | 4471.6 | 4366.5 | 4101.7 | 3946.8 | 3878.5 |
| 25°    | 4352.9 | 4206.8 | 3905.7 | 3718.8 | 3650.1 |
| 27.5°  | 4211.6 | 4056.2 | 3723.1 | 3508.7 | 3403.6 |
| 30°    | 4061.0 | 3887.3 | 3522.3 | 3289.8 | 3166.4 |
| 32.5°  | 3914.9 | 3704.7 | 3331.0 | 3057.1 | 2942.8 |
| 35°    | 3750.7 | 3517.9 | 3116.6 | 2829.1 | 2728.4 |
| 37.5°  | 3591.1 | 3339.8 | 2915.7 | 2600.5 | 2486.8 |
| 40°    | 3422.0 | 3148.6 | 2705.6 | 2381.7 | 2263.1 |
| 42.5°  | 3248.7 | 2956.8 | 2496.0 | 2158.1 | 2044.3 |
| 45°    | 3066.3 | 2760.3 | 2281.5 | 1957.2 | 1847.8 |
| 47.5°  | 2892.9 | 2569.1 | 2076.3 | 1751.9 | 1651.7 |
| 50°    | 2701.2 | 2377.4 | 1875.4 | 1560.3 | 1464.9 |
| 52.5°  | 2513.9 | 2171.6 | 1683.7 | 1382.6 | 1295.9 |
| 55°    | 2331.3 | 1975.6 | 1482.7 | 1209.3 | 1122.6 |
| 57.5°  | 2144.6 | 1779.5 | 1305.1 | 1049.6 | 976.4  |
| 60°    | 1952.8 | 1587.9 | 1117.8 | 885.4  | 812.3  |
| 62.5°  | 1766.0 | 1401.0 | 958.1  | 739.3  | 702.9  |
| 65°    | 1574.2 | 1204.4 | 793.9  | 639.0  | 624.9  |
| 67.5°  | 1391.8 | 1021.9 | 639.0  | 561.0  | 547.5  |
| 70°    | 1200.0 | 844.3  | 529.1  | 483.6  | 465.2  |
| 72.5°  | 1017.5 | 679.7  | 442.5  | 406.1  | 396.9  |
| 75°    | 839.4  | 519.9  | 365.0  | 333.0  | 328.7  |
| 77.5°  | 661.7  | 369.4  | 287.6  | 269.2  | 259.9  |
| 80°    | 497.2  | 264.8  | 218.8  | 201.0  | 201.0  |
| 82.5°  | 346.6  | 178.1  | 150.6  | 141.4  | 141.4  |
| 85°    | 196.1  | 100.3  | 86.6   | 86.6   | 86.6   |
| 87.5°  | 73.1   | 36.3   | 36.3   | 31.9   | 31.9   |
| 90°    | 2.3    | 29.3   | 48.6   | 61.1   | 65.7   |
| 92.5°  | 61.1   | 51.2   | 58.4   | 63.4   | 65.7   |
| 95°    | 158.4  | 77.9   | 94.9   | 107.4  | 104.8  |
| 97.5°  | 285.1  | 85.4   | 124.2  | 131.6  | 134.0  |
| 100°   | 431.5  | 97.6   | 139.0  | 158.4  | 163.2  |
| 102.5° | 592.2  | 587.5  | 143.8  | 170.5  | 178.0  |
| 105°   | 740.9  | 814.2  | 148.7  | 175.4  | 185.2  |
| 107.5° | 914.0  | 974.8  | 153.7  | 180.3  | 190.2  |
| 110°   | 1079.8 | 1130.8 | 426.6  | 182.9  | 192.5  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1235.9 | 1279.6 | 1238.2 | 187.5  | 195.1  |
| 115°   | 1401.4 | 1442.8 | 1503.9 | 375.4  | 200.0  |
| 117.5° | 1545.3 | 1594.0 | 1635.6 | 1286.9 | 648.3  |
| 120°   | 1706.2 | 1742.7 | 1786.7 | 1815.9 | 1486.8 |
| 122.5° | 1842.6 | 1881.6 | 1930.5 | 1945.0 | 1947.6 |
| 125°   | 1981.5 | 2013.3 | 2059.6 | 2076.7 | 2083.9 |
| 127.5° | 2108.2 | 2142.4 | 2179.2 | 2203.5 | 2205.8 |
| 130°   | 2227.8 | 2266.9 | 2293.5 | 2320.4 | 2318.1 |
| 132.5° | 2349.6 | 2381.5 | 2408.1 | 2430.2 | 2427.8 |
| 135°   | 2452.1 | 2491.1 | 2512.9 | 2537.5 | 2532.6 |
| 137.5° | 2559.2 | 2588.4 | 2613.0 | 2637.3 | 2630.1 |
| 140°   | 2663.9 | 2683.7 | 2710.3 | 2732.2 | 2720.2 |
| 142.5° | 2752.0 | 2769.1 | 2800.6 | 2820.0 | 2807.9 |
| 145°   | 2844.6 | 2841.9 | 2883.4 | 2900.5 | 2888.3 |
| 147.5° | 2924.8 | 2917.6 | 2958.9 | 2971.1 | 2961.5 |
| 150°   | 3003.0 | 2985.9 | 3024.9 | 3039.3 | 3027.2 |
| 152.5° | 3068.6 | 3049.2 | 3085.7 | 3100.4 | 3083.4 |
| 155°   | 3132.0 | 3110.3 | 3139.5 | 3154.0 | 3134.6 |
| 157.5° | 3183.3 | 3163.9 | 3185.8 | 3202.9 | 3183.3 |
| 160°   | 3227.2 | 3212.4 | 3227.2 | 3241.7 | 3224.6 |
| 162.5° | 3266.0 | 3251.5 | 3263.7 | 3280.8 | 3258.8 |
| 165°   | 3300.2 | 3285.6 | 3293.0 | 3310.0 | 3293.0 |
| 167.5° | 3327.1 | 3312.4 | 3319.8 | 3336.9 | 3314.9 |
| 170°   | 3349.1 | 3334.3 | 3339.2 | 3356.3 | 3334.3 |
| 172.5° | 3363.6 | 3349.1 | 3353.9 | 3371.0 | 3349.1 |
| 175°   | 3375.7 | 3358.6 | 3363.6 | 3380.6 | 3356.3 |
| 177.5° | 3380.6 | 3363.6 | 3366.1 | 3383.2 | 3361.3 |
| 180°   | 3368.5 | 3368.5 | 3368.5 | 3368.5 | 3368.5 |

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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 | 11.66            | 12.50 | 12.62 | 13.47 | 14.73 | 7.63           | 8.47  | 8.58  | 9.43  | 10.69 |
|                 | 3H   | 13.35            | 14.10 | 14.31 | 15.07 | 16.35 | 8.82           | 9.57  | 9.78  | 10.54 | 11.82 |
|                 | 4H   | 13.96            | 14.67 | 14.94 | 15.65 | 16.93 | 9.27           | 9.98  | 10.25 | 10.95 | 12.24 |
|                 | 6H   | 14.38            | 15.04 | 15.37 | 16.02 | 17.32 | 9.59           | 10.24 | 10.58 | 11.23 | 12.53 |
|                 | 8H   | 14.51            | 15.14 | 15.51 | 16.13 | 17.43 | 9.68           | 10.30 | 10.68 | 11.30 | 12.60 |
|                 | 12H  | 14.58            | 15.17 | 15.58 | 16.16 | 17.48 | 9.72           | 10.32 | 10.72 | 11.31 | 12.63 |
| 4H              | 2H   | 11.68            | 12.39 | 12.67 | 13.37 | 14.66 | 8.22           | 8.93  | 9.21  | 9.91  | 11.20 |
|                 | 3H   | 13.52            | 14.11 | 14.51 | 15.12 | 16.42 | 9.58           | 10.17 | 10.57 | 11.17 | 12.47 |
|                 | 4H   | 14.21            | 14.75 | 15.22 | 15.75 | 17.08 | 10.13          | 10.66 | 11.13 | 11.66 | 12.99 |
|                 | 6H   | 14.73            | 15.20 | 15.75 | 16.22 | 17.54 | 10.55          | 11.01 | 11.56 | 12.03 | 13.36 |
|                 | 8H   | 14.91            | 15.35 | 15.93 | 16.36 | 17.70 | 10.68          | 11.11 | 11.69 | 12.12 | 13.46 |
|                 | 12H  | 15.01            | 15.40 | 16.04 | 16.43 | 17.77 | 10.74          | 11.13 | 11.77 | 12.16 | 13.51 |
| 8H              | 4H   | 14.18            | 14.62 | 15.20 | 15.63 | 16.97 | 10.41          | 10.84 | 11.42 | 11.86 | 13.19 |
|                 | 6H   | 14.75            | 15.11 | 15.79 | 16.17 | 17.50 | 10.93          | 11.29 | 11.97 | 12.34 | 13.68 |
|                 | 8H   | 14.97            | 15.29 | 16.02 | 16.33 | 17.69 | 11.12          | 11.44 | 12.17 | 12.48 | 13.83 |
|                 | 12H  | 15.12            | 15.39 | 16.17 | 16.43 | 17.83 | 11.24          | 11.52 | 12.29 | 12.56 | 13.95 |
| 12H             | 4H   | 14.14            | 14.53 | 15.17 | 15.56 | 16.90 | 10.41          | 10.80 | 11.45 | 11.84 | 13.18 |
|                 | 6H   | 14.73            | 15.04 | 15.78 | 16.09 | 17.44 | 10.98          | 11.29 | 12.03 | 12.34 | 13.69 |
|                 | 8H   | 14.95            | 15.23 | 16.00 | 16.27 | 17.67 | 11.19          | 11.47 | 12.24 | 12.51 | 13.90 |

END OF REPORT