

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: P927414

Luminaire Tested: DFN2DIP-HX4F0-100D040US835-RLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P927414  
REPORT IS A COMBINATION OF REPORTS P900832 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-100D040US835-RLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

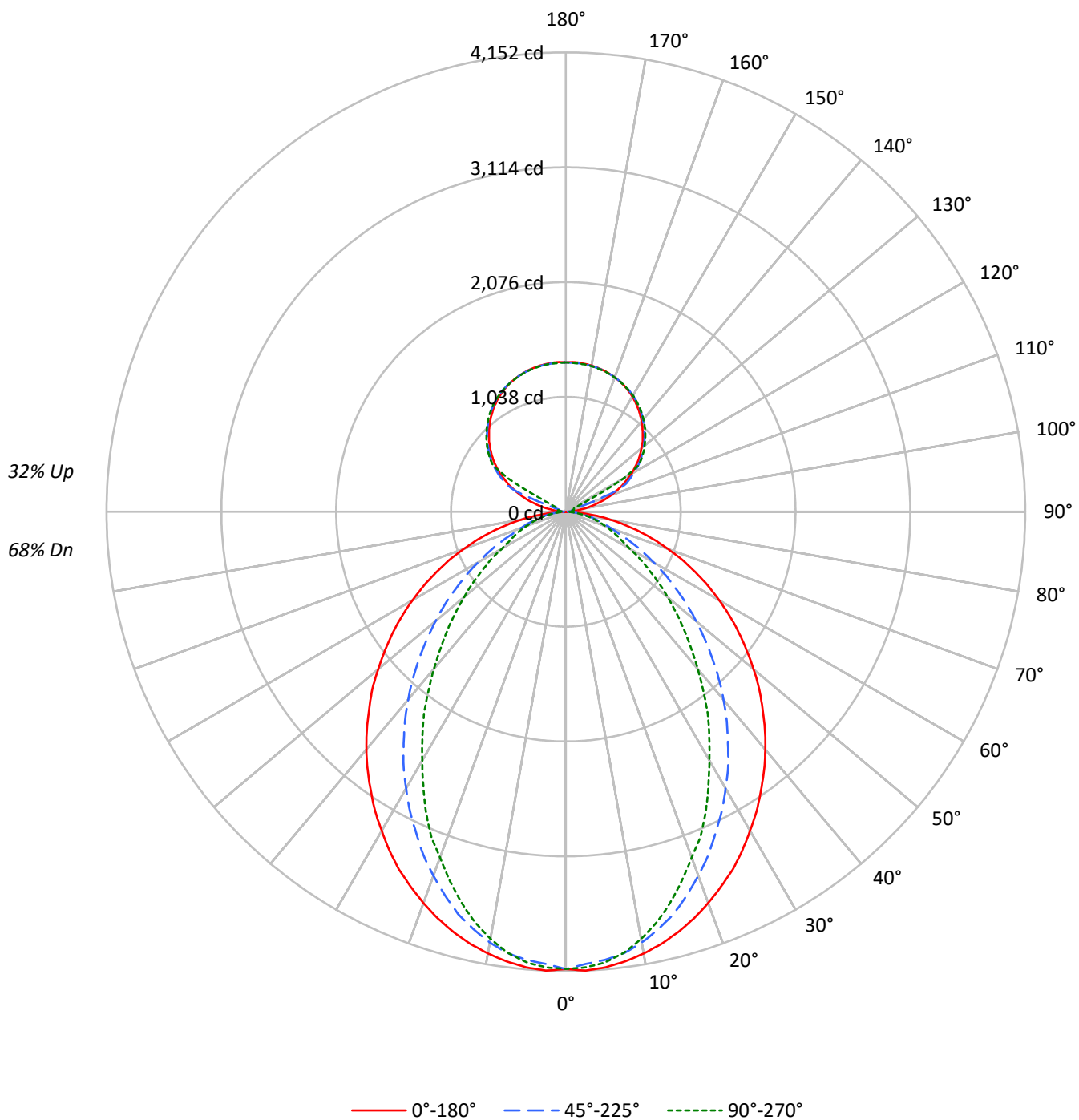
Lumens per Lamp: N/A  
Luminaire Lumens: 12460.0 lumens  
Efficiency: N/A  
Efficacy: 96.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 129.5  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.946  
Total Harmonic Distortion (THDi): 0.132  
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 |    |    | 0  |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 |
| RCR |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 111 | 111 | 111 | 111 | 105 | 105 | 105 | 105 | 93 | 93 | 93 | 83 | 83 | 83 | 73 | 73 | 73 | 65 | 65 | 65 |
| 1   | 103 | 98  | 95  | 91  | 97  | 93  | 90  | 87  | 83 | 81 | 78 | 74 | 72 | 70 | 65 | 64 | 63 | 59 | 58 | 57 |
| 2   | 94  | 87  | 81  | 76  | 88  | 82  | 77  | 72  | 74 | 69 | 66 | 66 | 63 | 60 | 58 | 56 | 54 | 50 | 49 | 48 |
| 3   | 86  | 77  | 70  | 64  | 81  | 73  | 66  | 61  | 66 | 60 | 56 | 59 | 55 | 51 | 52 | 49 | 47 | 43 | 42 | 41 |
| 4   | 79  | 69  | 61  | 55  | 75  | 65  | 58  | 53  | 59 | 53 | 49 | 53 | 48 | 45 | 47 | 44 | 41 | 38 | 37 | 36 |
| 5   | 73  | 62  | 53  | 48  | 69  | 59  | 51  | 46  | 53 | 47 | 42 | 48 | 43 | 39 | 43 | 39 | 36 | 33 | 32 | 31 |
| 6   | 68  | 56  | 47  | 42  | 64  | 53  | 46  | 40  | 48 | 42 | 38 | 43 | 39 | 35 | 39 | 35 | 32 | 30 | 29 | 28 |
| 7   | 63  | 50  | 43  | 37  | 59  | 48  | 41  | 36  | 44 | 38 | 33 | 40 | 35 | 31 | 36 | 32 | 29 | 26 | 25 | 24 |
| 8   | 58  | 46  | 38  | 33  | 55  | 44  | 37  | 32  | 40 | 34 | 30 | 37 | 32 | 28 | 33 | 29 | 26 | 24 | 23 | 22 |
| 9   | 55  | 42  | 35  | 30  | 52  | 41  | 34  | 29  | 37 | 31 | 27 | 34 | 29 | 25 | 31 | 27 | 24 | 22 | 21 | 20 |
| 10  | 51  | 39  | 32  | 27  | 48  | 37  | 31  | 26  | 34 | 29 | 25 | 31 | 27 | 23 | 29 | 25 | 22 | 20 | 19 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3073 | 3073 | 3073 |
| 5°  | 3078 | 3025 | 3044 |
| 10° | 3048 | 2966 | 2945 |
| 15° | 3006 | 2868 | 2792 |
| 20° | 2951 | 2733 | 2604 |
| 25° | 2895 | 2582 | 2423 |
| 30° | 2818 | 2427 | 2193 |
| 35° | 2744 | 2260 | 1991 |
| 40° | 2668 | 2088 | 1759 |
| 45° | 2580 | 1896 | 1549 |
| 50° | 2489 | 1703 | 1344 |
| 55° | 2394 | 1496 | 1147 |
| 60° | 2284 | 1280 | 944  |
| 65° | 2157 | 1060 | 850  |
| 70° | 2004 | 855  | 769  |
| 75° | 1811 | 755  | 700  |
| 80° | 1532 | 634  | 608  |
| 85° | 1071 | 425  | 458  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2580 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 387.3   | 3.1       |
| 10°-20°   | 1063.3  | 8.5       |
| 20°-30°   | 1492.9  | 12.0      |
| 30°-40°   | 1627.4  | 13.1      |
| 40°-50°   | 1495.7  | 12.0      |
| 50°-60°   | 1174.7  | 9.4       |
| 60°-70°   | 764.6   | 6.1       |
| 70°-80°   | 393.6   | 3.2       |
| 80°-90°   | 102.9   | 0.8       |
| 90°-100°  | 44.5    | 0.4       |
| 100°-110° | 165.9   | 1.3       |
| 110°-120° | 440.1   | 3.5       |
| 120°-130° | 729.9   | 5.9       |
| 130°-140° | 775.4   | 6.2       |
| 140°-150° | 720.6   | 5.8       |
| 150°-160° | 579.4   | 4.6       |
| 160°-170° | 373.3   | 3.0       |
| 170°-180° | 128.5   | 1.0       |
| 0°-30°    | 2943.6  | 23.6      |
| 0°-40°    | 4571.0  | 36.7      |
| 0°-60°    | 7241.3  | 58.1      |
| 0°-90°    | 8502.4  | 68.2      |
| 90°-120°  | 650.5   | 5.2       |
| 90°-150°  | 2876.4  | 23.1      |
| 90°-180°  | 3958.0  | 31.8      |
| 0°-180°   | 12460.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4133 | 4133  | 4133 | 4133  | 4133 |      |
| 5°   | 4133 | 4114  | 4066 | 4099  | 4088 | 392  |
| 15°  | 3931 | 3890  | 3763 | 3692  | 3654 | 1108 |
| 25°  | 3568 | 3448  | 3202 | 3048  | 2992 | 1641 |
| 35°  | 3075 | 2884  | 2555 | 2319  | 2236 | 1924 |
| 45°  | 2514 | 2263  | 1870 | 1604  | 1515 | 1941 |
| 55°  | 1911 | 1620  | 1216 | 991   | 920  | 1708 |
| 65°  | 1290 | 987   | 651  | 524   | 512  | 1279 |
| 75°  | 688  | 426   | 299  | 273   | 269  | 728  |
| 85°  | 161  | 82    | 71   | 71    | 71   | 184  |
| 90°  | 1    | 12    | 20   | 24    | 26   | 12   |
| 95°  | 63   | 31    | 38   | 43    | 42   | 75   |
| 105° | 297  | 326   | 60   | 70    | 74   | 317  |
| 115° | 562  | 578   | 603  | 150   | 80   | 553  |
| 125° | 794  | 807   | 825  | 832   | 835  | 708  |
| 135° | 983  | 998   | 1007 | 1017  | 1015 | 759  |
| 145° | 1140 | 1139  | 1156 | 1162  | 1158 | 713  |
| 155° | 1255 | 1246  | 1258 | 1264  | 1256 | 578  |
| 165° | 1323 | 1317  | 1320 | 1326  | 1320 | 374  |
| 175° | 1353 | 1346  | 1348 | 1355  | 1345 | 129  |
| 180° | 1350 | 1350  | 1350 | 1350  | 1350 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4133.0 | 4133.0 | 4133.0 | 4133.0 | 4133.0 |
| 2.5°   | 4151.6 | 4133.0 | 4091.7 | 4129.4 | 4121.9 |
| 5°     | 4133.0 | 4114.3 | 4065.5 | 4099.3 | 4088.1 |
| 7.5°   | 4099.3 | 4077.0 | 4024.6 | 4039.3 | 4020.7 |
| 10°    | 4054.4 | 4028.2 | 3953.6 | 3942.1 | 3919.9 |
| 12.5°  | 3998.5 | 3964.7 | 3863.5 | 3841.3 | 3800.0 |
| 15°    | 3931.0 | 3889.7 | 3762.7 | 3691.7 | 3654.4 |
| 17.5°  | 3852.4 | 3792.5 | 3635.4 | 3553.2 | 3493.3 |
| 20°    | 3762.7 | 3687.7 | 3500.8 | 3407.6 | 3325.0 |
| 22.5°  | 3665.5 | 3579.4 | 3362.3 | 3235.4 | 3179.4 |
| 25°    | 3568.3 | 3448.5 | 3201.6 | 3048.4 | 2992.1 |
| 27.5°  | 3452.4 | 3325.0 | 3052.0 | 2876.2 | 2790.1 |
| 30°    | 3329.0 | 3186.5 | 2887.3 | 2696.9 | 2595.7 |
| 32.5°  | 3209.2 | 3036.9 | 2730.6 | 2506.0 | 2412.3 |
| 35°    | 3074.6 | 2883.8 | 2554.8 | 2319.1 | 2236.5 |
| 37.5°  | 2943.7 | 2737.7 | 2390.1 | 2131.8 | 2038.5 |
| 40°    | 2805.2 | 2581.0 | 2217.9 | 1952.4 | 1855.2 |
| 42.5°  | 2663.1 | 2423.8 | 2046.1 | 1769.1 | 1675.8 |
| 45°    | 2513.5 | 2262.7 | 1870.3 | 1604.4 | 1514.7 |
| 47.5°  | 2371.5 | 2106.0 | 1702.0 | 1436.1 | 1354.0 |
| 50°    | 2214.3 | 1948.8 | 1537.3 | 1279.0 | 1200.8 |
| 52.5°  | 2060.7 | 1780.2 | 1380.2 | 1133.3 | 1062.3 |
| 55°    | 1911.1 | 1619.5 | 1215.5 | 991.3  | 920.2  |
| 57.5°  | 1758.0 | 1458.7 | 1069.9 | 860.3  | 800.4  |
| 60°    | 1600.8 | 1301.6 | 916.3  | 725.8  | 665.9  |
| 62.5°  | 1447.6 | 1148.4 | 785.3  | 606.0  | 576.2  |
| 65°    | 1290.5 | 987.3  | 650.8  | 523.8  | 512.3  |
| 67.5°  | 1140.9 | 837.7  | 523.8  | 459.9  | 448.8  |
| 70°    | 983.7  | 692.1  | 433.7  | 396.4  | 381.4  |
| 72.5°  | 834.1  | 557.1  | 362.7  | 332.9  | 325.4  |
| 75°    | 688.1  | 426.2  | 299.2  | 273.0  | 269.4  |
| 77.5°  | 542.5  | 302.8  | 235.7  | 220.6  | 213.1  |
| 80°    | 407.5  | 217.1  | 179.4  | 164.7  | 164.7  |
| 82.5°  | 284.1  | 146.0  | 123.4  | 115.9  | 115.9  |
| 85°    | 160.7  | 82.1   | 71.0   | 71.0   | 71.0   |
| 87.5°  | 59.9   | 29.8   | 29.8   | 26.2   | 26.2   |
| 90°    | 0.9    | 11.7   | 19.5   | 24.5   | 26.3   |
| 92.5°  | 24.5   | 20.5   | 23.4   | 25.4   | 26.3   |
| 95°    | 63.4   | 31.2   | 38.0   | 43.0   | 42.0   |
| 97.5°  | 114.3  | 34.2   | 49.8   | 52.8   | 53.7   |
| 100°   | 172.9  | 39.1   | 55.7   | 63.4   | 65.4   |
| 102.5° | 237.3  | 235.5  | 57.6   | 68.3   | 71.3   |
| 105°   | 296.9  | 326.3  | 59.6   | 70.3   | 74.2   |
| 107.5° | 366.3  | 390.7  | 61.6   | 72.3   | 76.2   |
| 110°   | 432.8  | 453.2  | 171.0  | 73.3   | 77.1   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 495.3  | 512.8  | 496.2  | 75.2   | 78.2   |
| 115°   | 561.6  | 578.2  | 602.7  | 150.4  | 80.2   |
| 117.5° | 619.3  | 638.8  | 655.5  | 515.7  | 259.8  |
| 120°   | 683.8  | 698.4  | 716.0  | 727.8  | 595.9  |
| 122.5° | 738.4  | 754.1  | 773.7  | 779.5  | 780.5  |
| 125°   | 794.1  | 806.9  | 825.4  | 832.3  | 835.2  |
| 127.5° | 844.9  | 858.6  | 873.3  | 883.1  | 884.0  |
| 130°   | 892.8  | 908.5  | 919.1  | 929.9  | 929.0  |
| 132.5° | 941.6  | 954.4  | 965.1  | 973.9  | 973.0  |
| 135°   | 982.7  | 998.4  | 1007.1 | 1016.9 | 1015.0 |
| 137.5° | 1025.6 | 1037.3 | 1047.2 | 1056.9 | 1054.0 |
| 140°   | 1067.6 | 1075.5 | 1086.2 | 1095.0 | 1090.1 |
| 142.5° | 1102.9 | 1109.7 | 1122.4 | 1130.1 | 1125.3 |
| 145°   | 1140.0 | 1139.0 | 1155.5 | 1162.4 | 1157.5 |
| 147.5° | 1172.1 | 1169.2 | 1185.8 | 1190.7 | 1186.9 |
| 150°   | 1203.4 | 1196.6 | 1212.3 | 1218.1 | 1213.2 |
| 152.5° | 1229.8 | 1222.0 | 1236.6 | 1242.5 | 1235.7 |
| 155°   | 1255.2 | 1246.5 | 1258.2 | 1264.0 | 1256.2 |
| 157.5° | 1275.7 | 1267.9 | 1276.8 | 1283.6 | 1275.7 |
| 160°   | 1293.3 | 1287.4 | 1293.3 | 1299.1 | 1292.3 |
| 162.5° | 1308.9 | 1303.1 | 1308.0 | 1314.8 | 1306.0 |
| 165°   | 1322.6 | 1316.8 | 1319.7 | 1326.5 | 1319.7 |
| 167.5° | 1333.4 | 1327.4 | 1330.5 | 1337.3 | 1328.5 |
| 170°   | 1342.2 | 1336.3 | 1338.2 | 1345.1 | 1336.3 |
| 172.5° | 1348.0 | 1342.2 | 1344.2 | 1351.0 | 1342.2 |
| 175°   | 1352.8 | 1346.0 | 1348.0 | 1354.8 | 1345.1 |
| 177.5° | 1354.8 | 1348.0 | 1349.0 | 1355.9 | 1347.1 |
| 180°   | 1350.0 | 1350.0 | 1350.0 | 1350.0 | 1350.0 |

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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 | 12.60            | 13.61 | 13.39 | 14.42 | 15.40 | 8.58           | 9.58  | 9.37  | 10.39 | 11.38 |
|                 | 3H   | 14.29            | 15.19 | 15.10 | 16.01 | 17.03 | 9.78           | 10.68 | 10.58 | 11.50 | 12.51 |
|                 | 4H   | 14.91            | 15.76 | 15.73 | 16.58 | 17.61 | 10.24          | 11.09 | 11.06 | 11.91 | 12.94 |
|                 | 6H   | 15.34            | 16.12 | 16.18 | 16.96 | 18.00 | 10.57          | 11.35 | 11.40 | 12.19 | 13.23 |
|                 | 8H   | 15.48            | 16.22 | 16.32 | 17.07 | 18.11 | 10.67          | 11.41 | 11.51 | 12.26 | 13.30 |
|                 | 12H  | 15.54            | 16.25 | 16.39 | 17.10 | 18.16 | 10.72          | 11.42 | 11.57 | 12.27 | 13.34 |
| 4H              | 2H   | 12.64            | 13.49 | 13.47 | 14.32 | 15.34 | 9.19           | 10.04 | 10.02 | 10.87 | 11.89 |
|                 | 3H   | 14.49            | 15.19 | 15.33 | 16.05 | 17.10 | 10.56          | 11.26 | 11.40 | 12.12 | 13.17 |
|                 | 4H   | 15.19            | 15.83 | 16.04 | 16.69 | 17.76 | 11.12          | 11.76 | 11.97 | 12.61 | 13.69 |
|                 | 6H   | 15.71            | 16.27 | 16.58 | 17.15 | 18.22 | 11.55          | 12.10 | 12.41 | 12.98 | 14.06 |
|                 | 8H   | 15.89            | 16.41 | 16.76 | 17.28 | 18.37 | 11.68          | 12.20 | 12.55 | 13.07 | 14.16 |
|                 | 12H  | 16.00            | 16.46 | 16.89 | 17.36 | 18.45 | 11.76          | 12.22 | 12.64 | 13.11 | 14.21 |
| 8H              | 4H   | 15.17            | 15.68 | 16.04 | 16.56 | 17.65 | 11.41          | 11.93 | 12.28 | 12.80 | 13.89 |
|                 | 6H   | 15.74            | 16.17 | 16.64 | 17.09 | 18.18 | 11.94          | 12.36 | 12.83 | 13.28 | 14.37 |
|                 | 8H   | 15.96            | 16.34 | 16.87 | 17.25 | 18.36 | 12.13          | 12.51 | 13.04 | 13.42 | 14.53 |
|                 | 12H  | 16.11            | 16.44 | 17.02 | 17.34 | 18.50 | 12.26          | 12.59 | 13.17 | 13.49 | 14.65 |
| 12H             | 4H   | 15.13            | 15.59 | 16.02 | 16.49 | 17.58 | 11.42          | 11.89 | 12.31 | 12.78 | 13.88 |
|                 | 6H   | 15.72            | 16.10 | 16.63 | 17.01 | 18.11 | 11.99          | 12.37 | 12.89 | 13.28 | 14.38 |
|                 | 8H   | 15.95            | 16.28 | 16.86 | 17.18 | 18.34 | 12.21          | 12.54 | 13.12 | 13.44 | 14.60 |

END OF REPORT