

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: P902541

Luminaire Tested: DFN2DIP-HX3F0-030D090US830-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P902541  
REPORT IS A COMBINATION OF REPORTS P899286 AND P896089  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX3F0-030D090US830-RLLFLL  
Description: 3 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

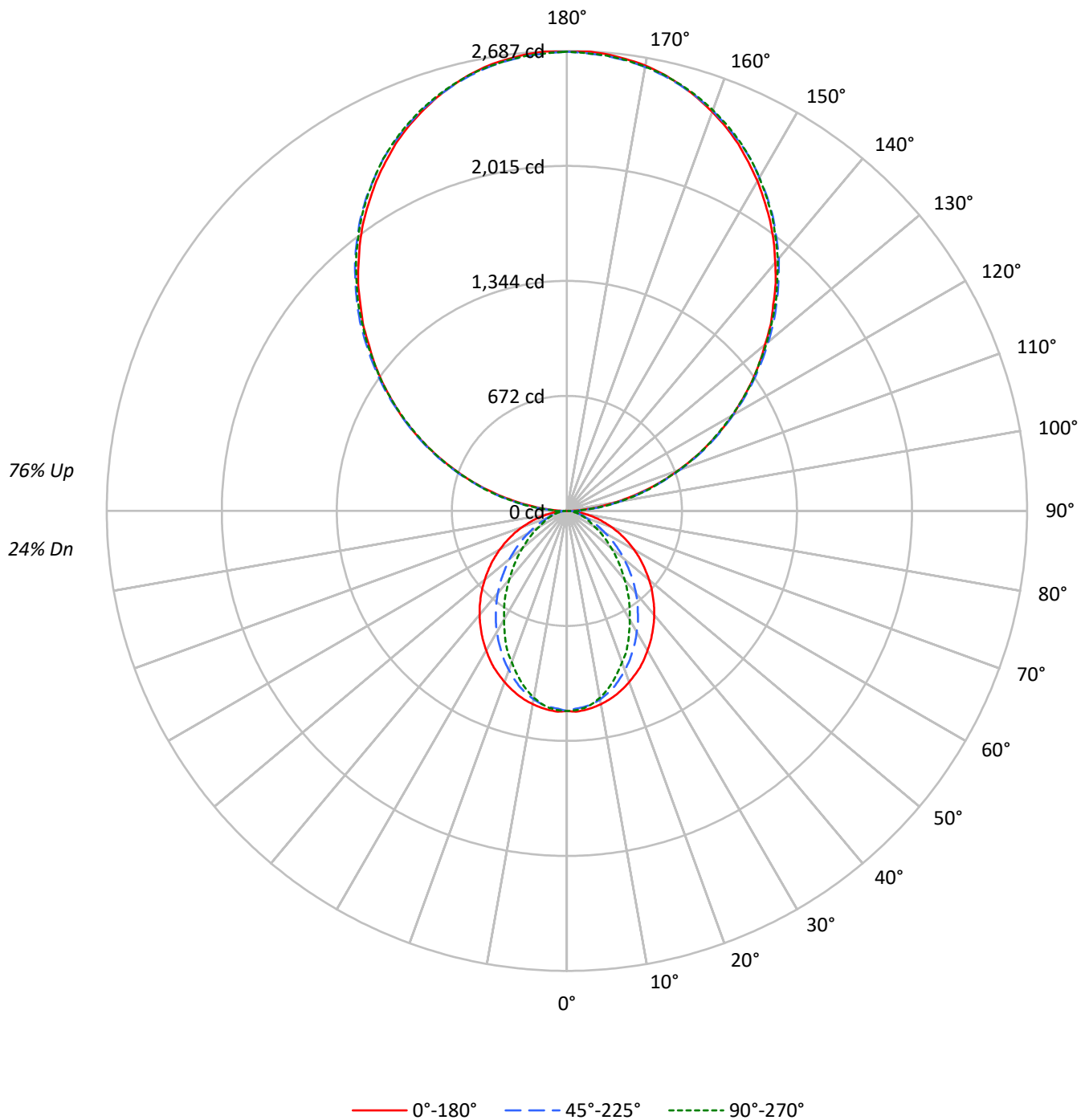
Lumens per Lamp: N/A  
Luminaire Lumens: 9910.8 lumens  
Efficiency: N/A  
Efficacy: 104.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.84' x L: 3.28' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 94.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.983  
Total Harmonic Distortion (THDi): 0.073  
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



TEST NUMBER: P902541

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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   | 101 | 101 | 101 | 101 | 90 | 90 | 90 | 90 | 69 | 69 | 69 | 50 | 50 | 50 | 33 | 33 | 33 |
| 1   | 92  | 88  | 85  | 81  | 82 | 79 | 76 | 73 | 61 | 59 | 57 | 44 | 43 | 42 | 29 | 28 | 28 |
| 2   | 84  | 77  | 71  | 67  | 75 | 69 | 64 | 60 | 53 | 50 | 47 | 39 | 37 | 35 | 26 | 25 | 24 |
| 3   | 77  | 68  | 61  | 56  | 68 | 61 | 55 | 50 | 47 | 43 | 40 | 35 | 32 | 30 | 23 | 22 | 20 |
| 4   | 70  | 60  | 53  | 47  | 62 | 54 | 48 | 43 | 42 | 38 | 34 | 31 | 28 | 26 | 21 | 19 | 18 |
| 5   | 64  | 54  | 46  | 40  | 57 | 48 | 42 | 37 | 38 | 33 | 29 | 28 | 25 | 22 | 19 | 17 | 16 |
| 6   | 59  | 48  | 40  | 35  | 53 | 43 | 37 | 32 | 34 | 29 | 26 | 25 | 22 | 20 | 17 | 15 | 14 |
| 7   | 55  | 43  | 36  | 30  | 49 | 39 | 32 | 28 | 31 | 26 | 23 | 23 | 20 | 17 | 16 | 14 | 12 |
| 8   | 51  | 39  | 32  | 27  | 45 | 35 | 29 | 24 | 28 | 23 | 20 | 21 | 18 | 16 | 14 | 12 | 11 |
| 9   | 47  | 36  | 29  | 24  | 42 | 32 | 26 | 22 | 25 | 21 | 18 | 19 | 16 | 14 | 13 | 11 | 10 |
| 10  | 44  | 33  | 26  | 21  | 39 | 29 | 23 | 19 | 23 | 19 | 16 | 18 | 15 | 13 | 12 | 10 | 9  |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1354 | 1354 | 1354 |
| 5°  | 1355 | 1331 | 1340 |
| 10° | 1341 | 1304 | 1296 |
| 15° | 1322 | 1260 | 1228 |
| 20° | 1297 | 1200 | 1144 |
| 25° | 1272 | 1132 | 1064 |
| 30° | 1237 | 1063 | 962  |
| 35° | 1204 | 989  | 873  |
| 40° | 1169 | 913  | 770  |
| 45° | 1130 | 828  | 678  |
| 50° | 1089 | 742  | 587  |
| 55° | 1046 | 651  | 500  |
| 60° | 996  | 556  | 411  |
| 65° | 939  | 459  | 369  |
| 70° | 869  | 368  | 333  |
| 75° | 781  | 323  | 301  |
| 80° | 656  | 268  | 259  |
| 85° | 447  | 174  | 190  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2524 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 109.5  | 1.1       |
| 10°-20°   | 300.7  | 3.0       |
| 20°-30°   | 422.1  | 4.3       |
| 30°-40°   | 460.2  | 4.6       |
| 40°-50°   | 422.9  | 4.3       |
| 50°-60°   | 332.2  | 3.4       |
| 60°-70°   | 216.2  | 2.2       |
| 70°-80°   | 111.3  | 1.1       |
| 80°-90°   | 36.0   | 0.4       |
| 90°-100°  | 166.0  | 1.7       |
| 100°-110° | 527.5  | 5.3       |
| 110°-120° | 902.7  | 9.1       |
| 120°-130° | 1187.2 | 12.0      |
| 130°-140° | 1332.5 | 13.4      |
| 140°-150° | 1306.7 | 13.2      |
| 150°-160° | 1096.1 | 11.1      |
| 160°-170° | 726.9  | 7.3       |
| 170°-180° | 254.1  | 2.6       |
| 0°-30°    | 832.3  | 8.4       |
| 0°-40°    | 1292.5 | 13.0      |
| 0°-60°    | 2047.6 | 20.7      |
| 0°-90°    | 2411.1 | 24.3      |
| 90°-120°  | 1596.2 | 16.1      |
| 90°-150°  | 5422.6 | 54.7      |
| 90°-180°  | 7500.0 | 75.7      |
| 0°-180°   | 9910.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1169 | 1169  | 1169 | 1169  | 1169 |      |
| 5°   | 1169 | 1163  | 1150 | 1159  | 1156 | 111  |
| 15°  | 1112 | 1100  | 1064 | 1044  | 1033 | 313  |
| 25°  | 1009 | 975   | 905  | 862   | 846  | 464  |
| 35°  | 869  | 815   | 722  | 656   | 632  | 544  |
| 45°  | 711  | 640   | 529  | 454   | 428  | 549  |
| 55°  | 540  | 458   | 344  | 280   | 260  | 483  |
| 65°  | 365  | 279   | 184  | 148   | 145  | 362  |
| 75°  | 194  | 121   | 85   | 77    | 76   | 206  |
| 85°  | 45   | 23    | 20   | 20    | 20   | 52   |
| 90°  | 2    | 29    | 79   | 74    | 77   | 10   |
| 95°  | 118  | 141   | 145  | 145   | 141  | 131  |
| 105° | 487  | 493   | 498  | 502   | 502  | 514  |
| 115° | 906  | 919   | 915  | 912   | 906  | 896  |
| 125° | 1318 | 1338  | 1331 | 1324  | 1322 | 1177 |
| 135° | 1704 | 1729  | 1734 | 1732  | 1725 | 1317 |
| 145° | 2069 | 2085  | 2098 | 2100  | 2092 | 1293 |
| 155° | 2366 | 2372  | 2380 | 2391  | 2384 | 1089 |
| 165° | 2574 | 2571  | 2571 | 2587  | 2576 | 726  |
| 175° | 2678 | 2671  | 2667 | 2683  | 2669 | 254  |
| 180° | 2683 | 2683  | 2683 | 2683  | 2683 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1168.7 | 1168.7 | 1168.7 | 1168.7 | 1168.7 |
| 2.5°   | 1173.9 | 1168.7 | 1157.0 | 1167.6 | 1165.5 |
| 5°     | 1168.7 | 1163.4 | 1149.6 | 1159.1 | 1155.9 |
| 7.5°   | 1159.1 | 1152.8 | 1138.0 | 1142.2 | 1136.9 |
| 10°    | 1146.4 | 1139.1 | 1117.9 | 1114.7 | 1108.4 |
| 12.5°  | 1130.6 | 1121.1 | 1092.5 | 1086.2 | 1074.5 |
| 15°    | 1111.5 | 1099.9 | 1063.9 | 1043.9 | 1033.3 |
| 17.5°  | 1089.3 | 1072.4 | 1027.9 | 1004.8 | 987.8  |
| 20°    | 1063.9 | 1042.7 | 989.9  | 963.6  | 940.2  |
| 22.5°  | 1036.5 | 1012.1 | 950.7  | 914.8  | 899.0  |
| 25°    | 1009.0 | 975.1  | 905.3  | 862.0  | 846.0  |
| 27.5°  | 976.2  | 940.2  | 863.0  | 813.3  | 788.9  |
| 30°    | 941.3  | 901.1  | 816.4  | 762.6  | 734.0  |
| 32.5°  | 907.4  | 858.8  | 772.1  | 708.6  | 682.1  |
| 35°    | 869.4  | 815.4  | 722.4  | 655.7  | 632.4  |
| 37.5°  | 832.4  | 774.1  | 675.8  | 602.8  | 576.5  |
| 40°    | 793.2  | 729.8  | 627.2  | 552.0  | 524.6  |
| 42.5°  | 753.0  | 685.4  | 578.5  | 500.2  | 473.8  |
| 45°    | 710.8  | 639.8  | 528.9  | 453.6  | 428.3  |
| 47.5°  | 670.5  | 595.5  | 481.3  | 406.0  | 382.9  |
| 50°    | 626.1  | 551.0  | 434.7  | 361.7  | 339.5  |
| 52.5°  | 582.7  | 503.4  | 390.3  | 320.5  | 300.4  |
| 55°    | 540.4  | 457.9  | 343.7  | 280.3  | 260.2  |
| 57.5°  | 497.1  | 412.5  | 302.6  | 243.3  | 226.3  |
| 60°    | 452.6  | 368.1  | 259.1  | 205.2  | 188.3  |
| 62.5°  | 409.3  | 324.7  | 222.1  | 171.4  | 163.0  |
| 65°    | 364.9  | 279.2  | 184.0  | 148.1  | 144.9  |
| 67.5°  | 322.6  | 236.9  | 148.1  | 130.1  | 126.9  |
| 70°    | 278.1  | 195.7  | 122.6  | 112.1  | 107.8  |
| 72.5°  | 235.8  | 157.5  | 102.5  | 94.2   | 92.0   |
| 75°    | 194.5  | 120.6  | 84.6   | 77.2   | 76.2   |
| 77.5°  | 153.4  | 85.6   | 66.6   | 62.4   | 60.2   |
| 80°    | 115.3  | 61.4   | 50.7   | 46.6   | 46.6   |
| 82.5°  | 80.3   | 41.3   | 34.9   | 32.8   | 32.8   |
| 85°    | 45.4   | 23.2   | 20.1   | 20.1   | 20.1   |
| 87.5°  | 17.0   | 8.4    | 8.4    | 7.4    | 7.4    |
| 90°    | 2.5    | 29.1   | 79.3   | 74.4   | 76.8   |
| 92.5°  | 50.1   | 68.0   | 70.4   | 72.8   | 72.8   |
| 95°    | 118.1  | 140.7  | 144.8  | 144.8  | 140.7  |
| 97.5°  | 196.5  | 217.5  | 226.5  | 226.5  | 226.5  |
| 100°   | 287.1  | 305.8  | 312.2  | 312.2  | 309.8  |
| 102.5° | 382.6  | 396.3  | 405.2  | 407.6  | 405.2  |
| 105°   | 486.9  | 493.3  | 498.2  | 502.3  | 502.3  |
| 107.5° | 590.4  | 600.1  | 600.1  | 601.7  | 590.4  |
| 110°   | 690.7  | 703.7  | 703.7  | 703.7  | 697.2  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 799.1  | 812.8  | 810.4  | 804.0  | 799.1  |
| 115°   | 905.9  | 918.8  | 914.7  | 912.4  | 905.9  |
| 117.5° | 1011.8 | 1029.6 | 1018.3 | 1011.8 | 1005.3 |
| 120°   | 1118.6 | 1136.3 | 1118.6 | 1118.6 | 1111.3 |
| 122.5° | 1215.6 | 1238.3 | 1227.0 | 1220.5 | 1215.6 |
| 125°   | 1317.6 | 1337.8 | 1331.3 | 1324.0 | 1321.6 |
| 127.5° | 1417.0 | 1442.1 | 1433.2 | 1423.5 | 1417.0 |
| 130°   | 1510.0 | 1539.2 | 1535.1 | 1530.2 | 1521.4 |
| 132.5° | 1614.4 | 1637.0 | 1638.6 | 1627.3 | 1620.9 |
| 135°   | 1704.1 | 1729.2 | 1734.1 | 1731.6 | 1725.2 |
| 137.5° | 1804.4 | 1824.7 | 1828.7 | 1827.1 | 1817.4 |
| 140°   | 1892.6 | 1912.8 | 1924.1 | 1924.1 | 1915.2 |
| 142.5° | 1983.2 | 2003.4 | 2009.9 | 2012.3 | 2003.4 |
| 145°   | 2069.0 | 2085.1 | 2098.0 | 2100.5 | 2091.6 |
| 147.5° | 2145.8 | 2166.0 | 2175.7 | 2179.7 | 2170.9 |
| 150°   | 2225.1 | 2238.8 | 2247.7 | 2254.9 | 2247.7 |
| 152.5° | 2295.4 | 2309.1 | 2320.4 | 2329.4 | 2320.4 |
| 155°   | 2365.8 | 2372.2 | 2379.5 | 2390.9 | 2383.6 |
| 157.5° | 2426.4 | 2431.3 | 2435.3 | 2451.5 | 2440.1 |
| 160°   | 2480.6 | 2485.5 | 2487.9 | 2501.6 | 2491.9 |
| 162.5° | 2530.7 | 2530.7 | 2533.2 | 2548.5 | 2537.2 |
| 165°   | 2573.6 | 2571.2 | 2571.2 | 2587.4 | 2576.1 |
| 167.5° | 2612.4 | 2605.2 | 2605.2 | 2621.3 | 2610.0 |
| 170°   | 2641.6 | 2635.1 | 2632.7 | 2648.8 | 2635.1 |
| 172.5° | 2661.7 | 2655.3 | 2652.9 | 2669.1 | 2655.3 |
| 175°   | 2678.0 | 2671.4 | 2666.6 | 2682.9 | 2669.1 |
| 177.5° | 2686.8 | 2680.4 | 2675.5 | 2689.3 | 2675.5 |
| 180°   | 2682.9 | 2682.9 | 2682.9 | 2682.9 | 2682.9 |

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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 | 5.07             | 5.73 | 6.23 | 6.87 | 8.47  | 1.05           | 1.70 | 2.20 | 2.84 | 4.44 |
|                 | 3H   | 6.73             | 7.31 | 7.89 | 8.46 | 10.07 | 2.22           | 2.81 | 3.38 | 3.95 | 5.57 |
|                 | 4H   | 7.32             | 7.88 | 8.49 | 9.03 | 10.64 | 2.66           | 3.22 | 3.83 | 4.36 | 5.98 |
|                 | 6H   | 7.73             | 8.24 | 8.91 | 9.39 | 11.02 | 2.97           | 3.48 | 4.14 | 4.63 | 6.26 |
|                 | 8H   | 7.85             | 8.33 | 9.03 | 9.50 | 11.12 | 3.05           | 3.54 | 4.23 | 4.70 | 6.32 |
|                 | 12H  | 7.90             | 8.36 | 9.08 | 9.52 | 11.16 | 3.09           | 3.55 | 4.27 | 4.71 | 6.35 |
| 4H              | 2H   | 5.07             | 5.62 | 6.24 | 6.77 | 8.39  | 1.62           | 2.17 | 2.79 | 3.32 | 4.94 |
|                 | 3H   | 6.87             | 7.34 | 8.05 | 8.51 | 10.14 | 2.95           | 3.41 | 4.13 | 4.58 | 6.21 |
|                 | 4H   | 7.55             | 7.98 | 8.73 | 9.14 | 10.79 | 3.48           | 3.91 | 4.67 | 5.07 | 6.72 |
|                 | 6H   | 8.05             | 8.41 | 9.24 | 9.60 | 11.23 | 3.89           | 4.25 | 5.08 | 5.44 | 7.07 |
|                 | 8H   | 8.22             | 8.56 | 9.40 | 9.73 | 11.39 | 4.01           | 4.35 | 5.20 | 5.53 | 7.18 |
|                 | 12H  | 8.30             | 8.61 | 9.50 | 9.79 | 11.45 | 4.07           | 4.38 | 5.27 | 5.56 | 7.22 |
| 8H              | 4H   | 7.50             | 7.85 | 8.69 | 9.02 | 10.67 | 3.75           | 4.09 | 4.93 | 5.26 | 6.92 |
|                 | 6H   | 8.06             | 8.34 | 9.26 | 9.55 | 11.20 | 4.25           | 4.53 | 5.46 | 5.75 | 7.40 |
|                 | 8H   | 8.27             | 8.51 | 9.48 | 9.70 | 11.38 | 4.44           | 4.68 | 5.65 | 5.88 | 7.55 |
|                 | 12H  | 8.39             | 8.61 | 9.61 | 9.80 | 11.50 | 4.55           | 4.76 | 5.76 | 5.95 | 7.66 |
| 12H             | 4H   | 7.45             | 7.76 | 8.65 | 8.94 | 10.60 | 3.74           | 4.05 | 4.94 | 5.24 | 6.89 |
|                 | 6H   | 8.03             | 8.27 | 9.24 | 9.47 | 11.14 | 4.30           | 4.54 | 5.51 | 5.74 | 7.41 |
|                 | 8H   | 8.24             | 8.45 | 9.45 | 9.64 | 11.35 | 4.50           | 4.71 | 5.71 | 5.90 | 7.61 |

END OF REPORT