

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: P926890

Luminaire Tested: DFN2DIP-HX4F0-040D080US830-RLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P926890  
REPORT IS A COMBINATION OF REPORTS P900892 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-040D080US830-RLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

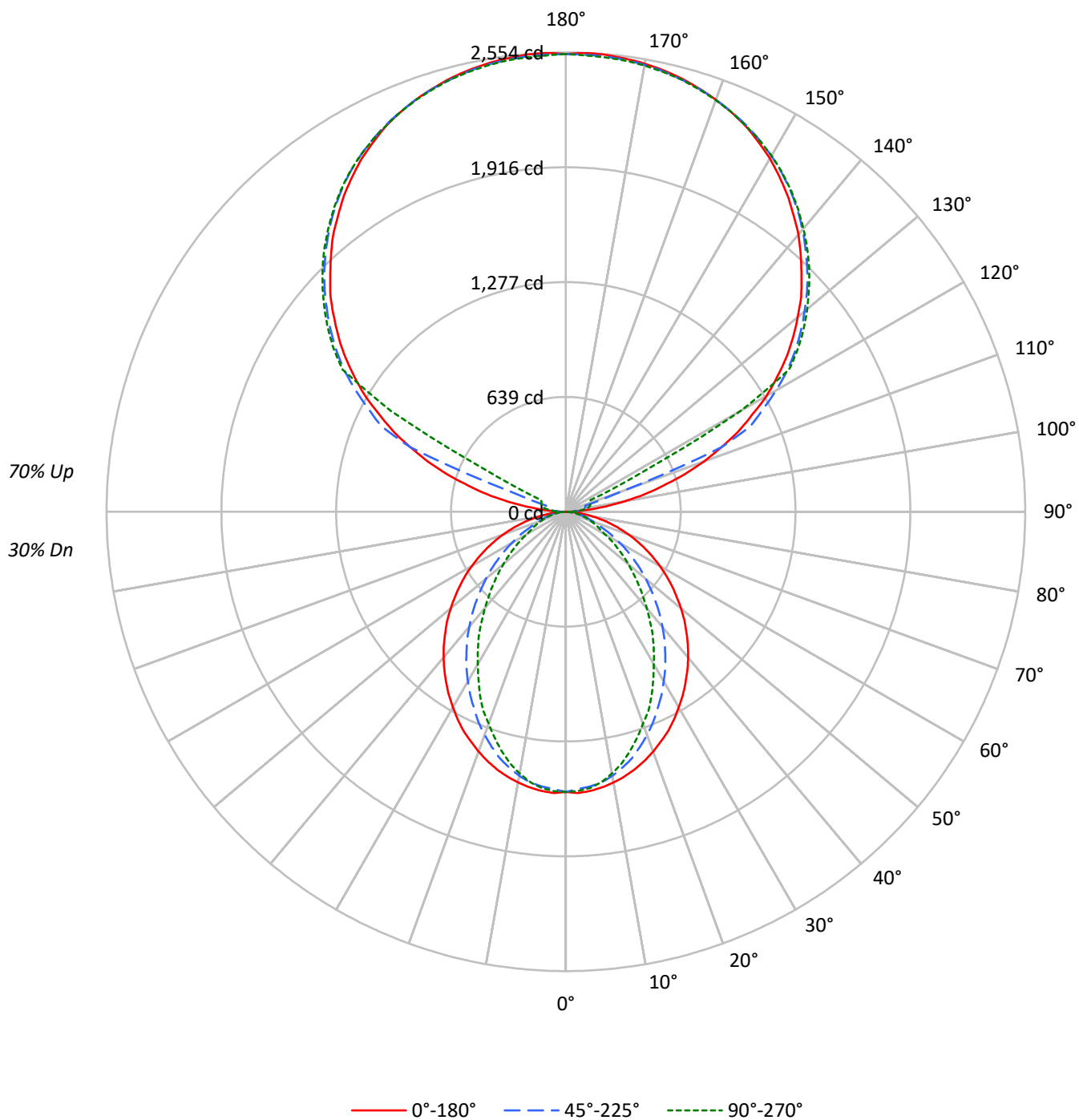
Lumens per Lamp: N/A  
Luminaire Lumens: 10669.1 lumens  
Efficiency: N/A  
Efficacy: 116.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 91.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9977  
Total Harmonic Distortion (THDi): 0.049  
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   | 102 | 102 | 102 | 102 | 92 | 92 | 92 | 92 | 72 | 72 | 72 | 54 | 54 | 54 | 38 | 38 | 38 |
| 1   | 94  | 90  | 86  | 83  | 84 | 81 | 77 | 75 | 64 | 62 | 60 | 48 | 47 | 46 | 34 | 33 | 32 |
| 2   | 85  | 78  | 73  | 68  | 76 | 71 | 66 | 62 | 56 | 53 | 50 | 43 | 40 | 39 | 30 | 29 | 28 |
| 3   | 78  | 69  | 62  | 57  | 70 | 62 | 57 | 52 | 50 | 46 | 42 | 38 | 35 | 33 | 27 | 25 | 24 |
| 4   | 71  | 61  | 54  | 48  | 64 | 55 | 49 | 44 | 44 | 40 | 36 | 34 | 31 | 28 | 24 | 22 | 21 |
| 5   | 66  | 55  | 47  | 41  | 59 | 49 | 43 | 38 | 40 | 35 | 31 | 30 | 27 | 25 | 22 | 20 | 18 |
| 6   | 60  | 49  | 41  | 36  | 54 | 44 | 38 | 33 | 36 | 31 | 27 | 28 | 24 | 22 | 20 | 18 | 16 |
| 7   | 56  | 44  | 37  | 31  | 50 | 40 | 34 | 29 | 32 | 28 | 24 | 25 | 22 | 19 | 18 | 16 | 15 |
| 8   | 52  | 40  | 33  | 28  | 46 | 36 | 30 | 25 | 29 | 25 | 21 | 23 | 20 | 17 | 17 | 15 | 13 |
| 9   | 48  | 37  | 29  | 25  | 43 | 33 | 27 | 23 | 27 | 22 | 19 | 21 | 18 | 15 | 16 | 13 | 12 |
| 10  | 45  | 33  | 27  | 22  | 40 | 30 | 24 | 20 | 25 | 20 | 17 | 20 | 16 | 14 | 14 | 12 | 11 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1159 | 1159 | 1159 |
| 5°  | 1160 | 1140 | 1148 |
| 10° | 1149 | 1118 | 1110 |
| 15° | 1133 | 1081 | 1053 |
| 20° | 1113 | 1030 | 982  |
| 25° | 1091 | 973  | 913  |
| 30° | 1063 | 915  | 827  |
| 35° | 1035 | 852  | 751  |
| 40° | 1006 | 787  | 663  |
| 45° | 973  | 715  | 584  |
| 50° | 938  | 642  | 507  |
| 55° | 903  | 564  | 432  |
| 60° | 861  | 483  | 356  |
| 65° | 813  | 400  | 320  |
| 70° | 756  | 322  | 290  |
| 75° | 683  | 284  | 264  |
| 80° | 578  | 239  | 229  |
| 85° | 404  | 160  | 173  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1309 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 146.0   | 1.4       |
| 10°-20°   | 400.9   | 3.8       |
| 20°-30°   | 562.8   | 5.3       |
| 30°-40°   | 613.5   | 5.8       |
| 40°-50°   | 563.9   | 5.3       |
| 50°-60°   | 442.8   | 4.2       |
| 60°-70°   | 288.3   | 2.7       |
| 70°-80°   | 148.4   | 1.4       |
| 80°-90°   | 42.4    | 0.4       |
| 90°-100°  | 83.9    | 0.8       |
| 100°-110° | 312.8   | 2.9       |
| 110°-120° | 829.6   | 7.8       |
| 120°-130° | 1375.9  | 12.9      |
| 130°-140° | 1461.6  | 13.7      |
| 140°-150° | 1358.3  | 12.7      |
| 150°-160° | 1092.1  | 10.2      |
| 160°-170° | 703.7   | 6.6       |
| 170°-180° | 242.2   | 2.3       |
| 0°-30°    | 1109.7  | 10.4      |
| 0°-40°    | 1723.2  | 16.2      |
| 0°-60°    | 2730.0  | 25.6      |
| 0°-90°    | 3209.0  | 30.1      |
| 90°-120°  | 1226.3  | 11.5      |
| 90°-150°  | 5422.1  | 50.8      |
| 90°-180°  | 7460.0  | 69.9      |
| 0°-180°   | 10669.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1558 | 1558  | 1558 | 1558  | 1558 |      |
| 5°   | 1558 | 1551  | 1533 | 1545  | 1541 | 148  |
| 15°  | 1482 | 1466  | 1419 | 1392  | 1378 | 418  |
| 25°  | 1345 | 1300  | 1207 | 1149  | 1128 | 619  |
| 35°  | 1159 | 1087  | 963  | 874   | 843  | 726  |
| 45°  | 948  | 853   | 705  | 605   | 571  | 732  |
| 55°  | 720  | 611   | 458  | 374   | 347  | 644  |
| 65°  | 486  | 372   | 245  | 198   | 193  | 482  |
| 75°  | 259  | 161   | 113  | 103   | 102  | 274  |
| 85°  | 61   | 31    | 27   | 27    | 27   | 70   |
| 90°  | 2    | 22    | 37   | 46    | 50   | 10   |
| 95°  | 120  | 59    | 72   | 81    | 79   | 142  |
| 105° | 560  | 615   | 112  | 132   | 140  | 598  |
| 115° | 1059 | 1090  | 1136 | 284   | 151  | 1042 |
| 125° | 1497 | 1521  | 1556 | 1569  | 1574 | 1335 |
| 135° | 1852 | 1882  | 1898 | 1917  | 1913 | 1431 |
| 145° | 2149 | 2147  | 2178 | 2191  | 2182 | 1344 |
| 155° | 2366 | 2350  | 2372 | 2383  | 2368 | 1090 |
| 165° | 2493 | 2482  | 2488 | 2500  | 2488 | 704  |
| 175° | 2550 | 2537  | 2541 | 2554  | 2536 | 243  |
| 180° | 2545 | 2545  | 2545 | 2545  | 2545 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1558.1 | 1558.1 | 1558.1 | 1558.1 | 1558.1 |
| 2.5°   | 1565.2 | 1558.1 | 1542.6 | 1556.8 | 1553.9 |
| 5°     | 1558.1 | 1551.1 | 1532.7 | 1545.4 | 1541.3 |
| 7.5°   | 1545.4 | 1537.0 | 1517.3 | 1522.8 | 1515.8 |
| 10°    | 1528.5 | 1518.7 | 1490.5 | 1486.1 | 1477.8 |
| 12.5°  | 1507.4 | 1494.7 | 1456.5 | 1448.2 | 1432.6 |
| 15°    | 1482.0 | 1466.4 | 1418.6 | 1391.8 | 1377.7 |
| 17.5°  | 1452.4 | 1429.8 | 1370.5 | 1339.6 | 1317.0 |
| 20°    | 1418.6 | 1390.3 | 1319.8 | 1284.6 | 1253.5 |
| 22.5°  | 1381.9 | 1349.5 | 1267.6 | 1219.7 | 1198.7 |
| 25°    | 1345.2 | 1300.1 | 1207.0 | 1149.3 | 1128.0 |
| 27.5°  | 1301.6 | 1253.5 | 1150.6 | 1084.3 | 1051.8 |
| 30°    | 1255.0 | 1201.3 | 1088.5 | 1016.7 | 978.6  |
| 32.5°  | 1209.9 | 1144.9 | 1029.4 | 944.8  | 909.4  |
| 35°    | 1159.2 | 1087.2 | 963.1  | 874.3  | 843.2  |
| 37.5°  | 1109.8 | 1032.1 | 901.0  | 803.7  | 768.5  |
| 40°    | 1057.6 | 973.0  | 836.2  | 736.1  | 699.4  |
| 42.5°  | 1004.0 | 913.8  | 771.3  | 666.9  | 631.8  |
| 45°    | 947.6  | 853.1  | 705.1  | 604.9  | 571.1  |
| 47.5°  | 894.1  | 794.0  | 641.7  | 541.5  | 510.5  |
| 50°    | 834.8  | 734.7  | 579.5  | 482.2  | 452.7  |
| 52.5°  | 776.9  | 671.2  | 520.4  | 427.2  | 400.5  |
| 55°    | 720.5  | 610.6  | 458.2  | 373.7  | 346.9  |
| 57.5°  | 662.8  | 549.9  | 403.3  | 324.3  | 301.8  |
| 60°    | 603.5  | 490.7  | 345.4  | 273.6  | 251.1  |
| 62.5°  | 545.8  | 433.0  | 296.0  | 228.5  | 217.2  |
| 65°    | 486.5  | 372.2  | 245.3  | 197.5  | 193.1  |
| 67.5°  | 430.2  | 315.8  | 197.5  | 173.4  | 169.2  |
| 70°    | 370.9  | 260.9  | 163.5  | 149.5  | 143.7  |
| 72.5°  | 314.5  | 210.1  | 136.8  | 125.5  | 122.7  |
| 75°    | 259.4  | 160.7  | 112.8  | 102.9  | 101.6  |
| 77.5°  | 204.5  | 114.1  | 88.9   | 83.2   | 80.3   |
| 80°    | 153.6  | 81.8   | 67.6   | 62.1   | 62.1   |
| 82.5°  | 107.2  | 55.0   | 46.6   | 43.6   | 43.6   |
| 85°    | 60.6   | 31.0   | 26.8   | 26.8   | 26.8   |
| 87.5°  | 22.6   | 11.2   | 11.2   | 9.9    | 9.9    |
| 90°    | 1.8    | 22.1   | 36.8   | 46.1   | 49.7   |
| 92.5°  | 46.1   | 38.7   | 44.2   | 47.9   | 49.7   |
| 95°    | 119.6  | 58.8   | 71.7   | 81.1   | 79.2   |
| 97.5°  | 215.4  | 64.5   | 93.8   | 99.5   | 101.2  |
| 100°   | 326.0  | 73.7   | 105.0  | 119.6  | 123.3  |
| 102.5° | 447.4  | 443.8  | 108.7  | 128.7  | 134.5  |
| 105°   | 559.8  | 615.1  | 112.3  | 132.5  | 140.0  |
| 107.5° | 690.5  | 736.4  | 116.1  | 136.2  | 143.6  |
| 110°   | 815.8  | 854.3  | 322.3  | 138.2  | 145.4  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 933.6  | 966.6  | 935.4  | 141.7  | 147.4  |
| 115°   | 1058.7 | 1090.0 | 1136.1 | 283.6  | 151.1  |
| 117.5° | 1167.4 | 1204.1 | 1235.6 | 972.1  | 489.8  |
| 120°   | 1289.0 | 1316.5 | 1349.8 | 1371.8 | 1123.2 |
| 122.5° | 1391.9 | 1421.5 | 1458.4 | 1469.4 | 1471.3 |
| 125°   | 1496.9 | 1520.9 | 1555.9 | 1568.8 | 1574.3 |
| 127.5° | 1592.6 | 1618.5 | 1646.3 | 1664.5 | 1666.3 |
| 130°   | 1682.9 | 1712.4 | 1732.6 | 1753.0 | 1751.2 |
| 132.5° | 1775.0 | 1799.0 | 1819.2 | 1835.8 | 1834.0 |
| 135°   | 1852.4 | 1881.9 | 1898.3 | 1917.0 | 1913.2 |
| 137.5° | 1933.4 | 1955.4 | 1974.0 | 1992.4 | 1986.9 |
| 140°   | 2012.4 | 2027.3 | 2047.5 | 2064.1 | 2054.8 |
| 142.5° | 2079.0 | 2091.8 | 2115.6 | 2130.3 | 2121.1 |
| 145°   | 2148.9 | 2146.9 | 2178.2 | 2191.1 | 2181.9 |
| 147.5° | 2209.5 | 2204.0 | 2235.2 | 2244.5 | 2237.2 |
| 150°   | 2268.5 | 2255.6 | 2285.1 | 2296.0 | 2286.9 |
| 152.5° | 2318.2 | 2303.5 | 2331.0 | 2342.2 | 2329.3 |
| 155°   | 2366.1 | 2349.7 | 2371.7 | 2382.6 | 2368.0 |
| 157.5° | 2404.7 | 2390.1 | 2406.7 | 2419.6 | 2404.7 |
| 160°   | 2438.0 | 2426.8 | 2438.0 | 2448.9 | 2436.0 |
| 162.5° | 2467.3 | 2456.3 | 2465.5 | 2478.4 | 2461.8 |
| 165°   | 2493.1 | 2482.2 | 2487.6 | 2500.5 | 2487.6 |
| 167.5° | 2513.4 | 2502.2 | 2507.9 | 2520.8 | 2504.2 |
| 170°   | 2530.0 | 2518.8 | 2522.6 | 2535.5 | 2518.8 |
| 172.5° | 2541.0 | 2530.0 | 2533.7 | 2546.6 | 2530.0 |
| 175°   | 2550.1 | 2537.2 | 2541.0 | 2553.8 | 2535.5 |
| 177.5° | 2553.8 | 2541.0 | 2542.9 | 2555.8 | 2539.2 |
| 180°   | 2544.7 | 2544.7 | 2544.7 | 2544.7 | 2544.7 |

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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 | 5.44             | 6.13 | 6.55  | 7.24  | 8.77  | 1.41           | 2.10 | 2.53 | 3.21 | 4.74 |
|                 | 3H   | 7.11             | 7.72 | 8.23  | 8.84  | 10.39 | 2.59           | 3.21 | 3.71 | 4.32 | 5.87 |
|                 | 4H   | 7.71             | 8.29 | 8.84  | 9.41  | 10.96 | 3.04           | 3.62 | 4.17 | 4.74 | 6.29 |
|                 | 6H   | 8.12             | 8.66 | 9.27  | 9.78  | 11.35 | 3.35           | 3.89 | 4.49 | 5.01 | 6.57 |
|                 | 8H   | 8.25             | 8.76 | 9.39  | 9.89  | 11.45 | 3.44           | 3.95 | 4.58 | 5.08 | 6.64 |
|                 | 12H  | 8.30             | 8.79 | 9.45  | 9.92  | 11.50 | 3.48           | 3.96 | 4.63 | 5.09 | 6.67 |
| 4H              | 2H   | 5.44             | 6.02 | 6.58  | 7.14  | 8.69  | 1.99           | 2.57 | 3.13 | 3.69 | 5.24 |
|                 | 3H   | 7.26             | 7.74 | 8.40  | 8.89  | 10.45 | 3.33           | 3.82 | 4.48 | 4.96 | 6.52 |
|                 | 4H   | 7.94             | 8.39 | 9.09  | 9.52  | 11.11 | 3.87           | 4.32 | 5.02 | 5.45 | 7.04 |
|                 | 6H   | 8.45             | 8.84 | 9.61  | 9.99  | 11.57 | 4.29           | 4.67 | 5.44 | 5.82 | 7.40 |
|                 | 8H   | 8.63             | 8.98 | 9.78  | 10.13 | 11.72 | 4.41           | 4.77 | 5.57 | 5.92 | 7.51 |
|                 | 12H  | 8.71             | 9.04 | 9.89  | 10.20 | 11.79 | 4.47           | 4.80 | 5.64 | 5.95 | 7.55 |
| 8H              | 4H   | 7.90             | 8.26 | 9.06  | 9.41  | 11.00 | 4.14           | 4.50 | 5.30 | 5.65 | 7.24 |
|                 | 6H   | 8.46             | 8.76 | 9.64  | 9.95  | 11.54 | 4.66           | 4.95 | 5.83 | 6.14 | 7.73 |
|                 | 8H   | 8.68             | 8.94 | 9.86  | 10.10 | 11.71 | 4.85           | 5.11 | 6.03 | 6.27 | 7.88 |
|                 | 12H  | 8.81             | 9.04 | 10.00 | 10.20 | 11.85 | 4.96           | 5.19 | 6.15 | 6.35 | 8.00 |
| 12H             | 4H   | 7.85             | 8.17 | 9.02  | 9.33  | 10.93 | 4.14           | 4.47 | 5.31 | 5.62 | 7.22 |
|                 | 6H   | 8.44             | 8.70 | 9.62  | 9.86  | 11.47 | 4.71           | 4.96 | 5.89 | 6.13 | 7.74 |
|                 | 8H   | 8.65             | 8.88 | 9.84  | 10.04 | 11.69 | 4.91           | 5.14 | 6.10 | 6.30 | 7.95 |

END OF REPORT