

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: P919994

Luminaire Tested: DFN2DIP-SQ3F0-040D070US935-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P919994  
REPORT IS A COMBINATION OF REPORTS P899916 AND P896733  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-040D070US935-RLLFLL  
Description: 3 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

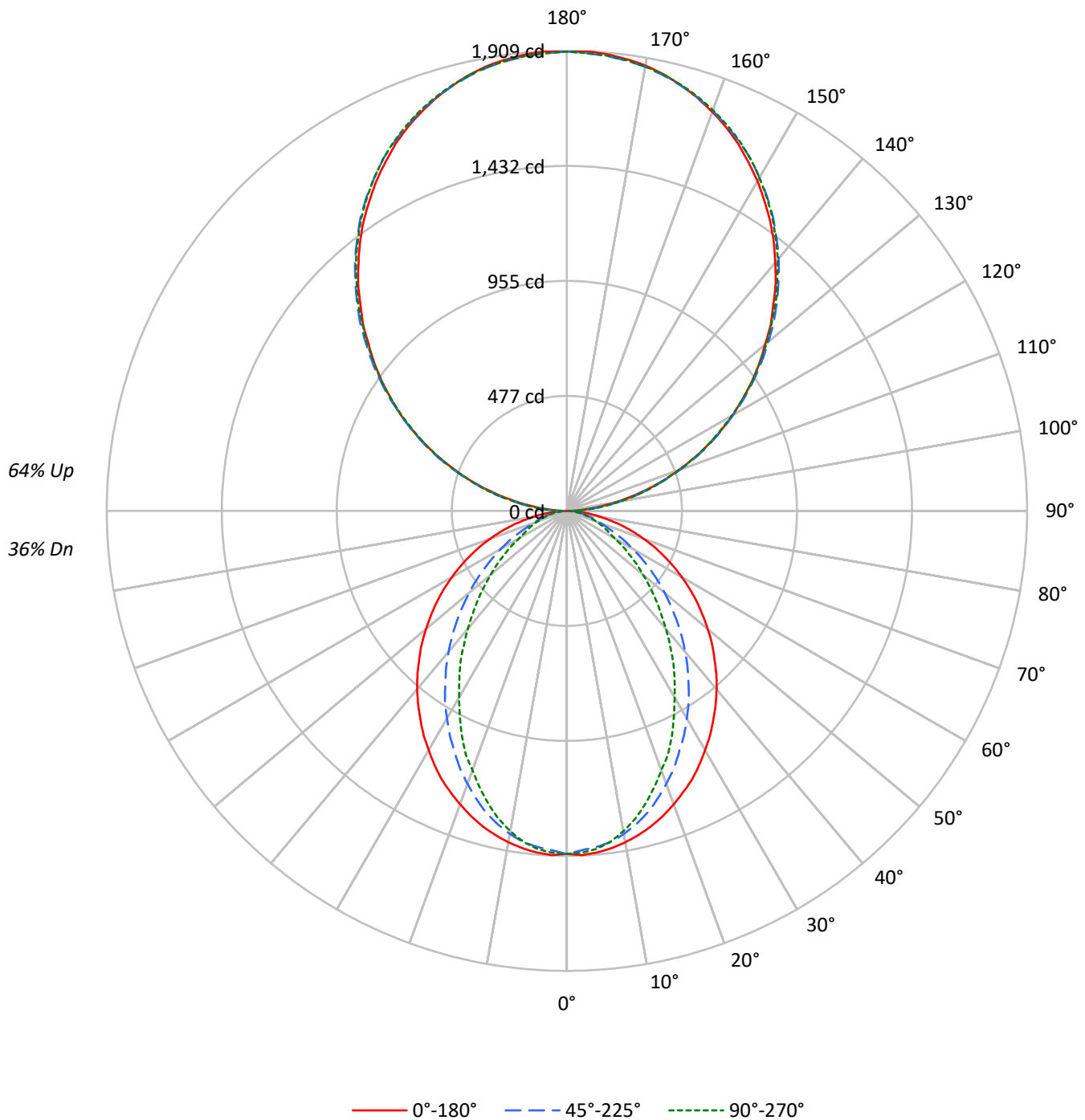
Lumens per Lamp: N/A  
Luminaire Lumens: 8261.3 lumens  
Efficiency: N/A  
Efficacy: 97.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 84.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9933  
Total Harmonic Distortion (THDi): 0.066  
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   | 104 | 104 | 104 | 104 | 94 | 94 | 94 | 94 | 75 | 75 | 75 | 58 | 58 | 58 | 43 | 43 | 43 |
| 1   | 95  | 91  | 87  | 84  | 86 | 82 | 79 | 76 | 66 | 64 | 62 | 52 | 50 | 49 | 38 | 37 | 37 |
| 2   | 87  | 80  | 74  | 69  | 78 | 72 | 67 | 63 | 59 | 55 | 52 | 46 | 44 | 42 | 34 | 33 | 31 |
| 3   | 79  | 70  | 63  | 58  | 71 | 64 | 58 | 53 | 52 | 48 | 44 | 41 | 38 | 36 | 31 | 29 | 27 |
| 4   | 73  | 62  | 55  | 49  | 65 | 57 | 50 | 45 | 46 | 42 | 38 | 37 | 33 | 31 | 27 | 25 | 24 |
| 5   | 67  | 56  | 48  | 42  | 60 | 51 | 44 | 39 | 42 | 37 | 33 | 33 | 29 | 27 | 25 | 23 | 21 |
| 6   | 61  | 50  | 42  | 37  | 55 | 46 | 39 | 34 | 37 | 32 | 29 | 30 | 26 | 24 | 23 | 20 | 18 |
| 7   | 57  | 45  | 37  | 32  | 51 | 41 | 35 | 30 | 34 | 29 | 25 | 27 | 24 | 21 | 21 | 18 | 17 |
| 8   | 53  | 41  | 33  | 28  | 48 | 38 | 31 | 26 | 31 | 26 | 23 | 25 | 21 | 19 | 19 | 17 | 15 |
| 9   | 49  | 37  | 30  | 25  | 44 | 34 | 28 | 24 | 28 | 24 | 20 | 23 | 19 | 17 | 18 | 15 | 14 |
| 10  | 46  | 34  | 27  | 23  | 42 | 31 | 25 | 21 | 26 | 21 | 18 | 21 | 18 | 15 | 16 | 14 | 12 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1631 | 1631 | 1631 |
| 5°  | 1633 | 1604 | 1615 |
| 10° | 1615 | 1571 | 1562 |
| 15° | 1592 | 1518 | 1480 |
| 20° | 1562 | 1446 | 1380 |
| 25° | 1530 | 1365 | 1283 |
| 30° | 1489 | 1282 | 1161 |
| 35° | 1448 | 1192 | 1053 |
| 40° | 1407 | 1100 | 930  |
| 45° | 1358 | 998  | 819  |
| 50° | 1308 | 894  | 709  |
| 55° | 1256 | 785  | 605  |
| 60° | 1196 | 670  | 498  |
| 65° | 1126 | 553  | 447  |
| 70° | 1042 | 444  | 404  |
| 75° | 935  | 389  | 366  |
| 80° | 781  | 323  | 316  |
| 85° | 530  | 211  | 235  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1917 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 133.4  | 1.6       |
| 10°-20°   | 366.2  | 4.4       |
| 20°-30°   | 514.2  | 6.2       |
| 30°-40°   | 560.5  | 6.8       |
| 40°-50°   | 515.1  | 6.2       |
| 50°-60°   | 404.5  | 4.9       |
| 60°-70°   | 263.3  | 3.2       |
| 70°-80°   | 135.6  | 1.6       |
| 80°-90°   | 40.0   | 0.5       |
| 90°-100°  | 117.9  | 1.4       |
| 100°-110° | 374.8  | 4.5       |
| 110°-120° | 641.3  | 7.8       |
| 120°-130° | 843.5  | 10.2      |
| 130°-140° | 946.7  | 11.5      |
| 140°-150° | 928.4  | 11.2      |
| 150°-160° | 778.8  | 9.4       |
| 160°-170° | 516.5  | 6.3       |
| 170°-180° | 180.5  | 2.2       |
| 0°-30°    | 1013.8 | 12.3      |
| 0°-40°    | 1574.2 | 19.1      |
| 0°-60°    | 2493.9 | 30.2      |
| 0°-90°    | 2932.8 | 35.5      |
| 90°-120°  | 1134.1 | 13.7      |
| 90°-150°  | 3852.7 | 46.6      |
| 90°-180°  | 5328.0 | 64.5      |
| 0°-180°   | 8261.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1423 | 1423  | 1423 | 1423  | 1423 |      |
| 5°   | 1423 | 1417  | 1400 | 1412  | 1408 | 135  |
| 15°  | 1354 | 1340  | 1296 | 1271  | 1259 | 382  |
| 25°  | 1229 | 1188  | 1103 | 1050  | 1030 | 565  |
| 35°  | 1059 | 993   | 880  | 799   | 770  | 663  |
| 45°  | 866  | 779   | 644  | 553   | 522  | 668  |
| 55°  | 658  | 558   | 419  | 341   | 317  | 588  |
| 65°  | 444  | 340   | 224  | 180   | 176  | 441  |
| 75°  | 237  | 147   | 103  | 94    | 93   | 251  |
| 85°  | 55   | 28    | 24   | 24    | 24   | 64   |
| 90°  | 2    | 21    | 56   | 53    | 55   | 8    |
| 95°  | 84   | 100   | 103  | 103   | 100  | 93   |
| 105° | 346  | 350   | 354  | 357   | 357  | 365  |
| 115° | 644  | 653   | 650  | 648   | 644  | 637  |
| 125° | 936  | 950   | 946  | 941   | 939  | 837  |
| 135° | 1211 | 1229  | 1232 | 1230  | 1226 | 936  |
| 145° | 1470 | 1481  | 1491 | 1492  | 1486 | 918  |
| 155° | 1681 | 1685  | 1691 | 1699  | 1694 | 774  |
| 165° | 1828 | 1827  | 1827 | 1838  | 1830 | 516  |
| 175° | 1903 | 1898  | 1895 | 1906  | 1896 | 181  |
| 180° | 1906 | 1906  | 1906 | 1906  | 1906 |      |

TEST NUMBER: P919994

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1423.4 | 1423.4 | 1423.4 | 1423.4 | 1423.4 |
| 2.5°   | 1429.9 | 1423.4 | 1409.2 | 1422.2 | 1419.5 |
| 5°     | 1423.4 | 1416.9 | 1400.2 | 1411.8 | 1408.0 |
| 7.5°   | 1411.8 | 1404.1 | 1386.1 | 1391.1 | 1384.7 |
| 10°    | 1396.4 | 1387.3 | 1361.6 | 1357.6 | 1350.0 |
| 12.5°  | 1377.1 | 1365.5 | 1330.6 | 1322.9 | 1308.7 |
| 15°    | 1353.8 | 1339.6 | 1295.9 | 1271.4 | 1258.6 |
| 17.5°  | 1326.8 | 1306.1 | 1252.0 | 1223.7 | 1203.1 |
| 20°    | 1295.9 | 1270.1 | 1205.7 | 1173.5 | 1145.1 |
| 22.5°  | 1262.4 | 1232.8 | 1158.0 | 1114.2 | 1095.0 |
| 25°    | 1228.9 | 1187.7 | 1102.6 | 1049.9 | 1030.4 |
| 27.5°  | 1189.0 | 1145.1 | 1051.1 | 990.6  | 960.9  |
| 30°    | 1146.5 | 1097.4 | 994.4  | 928.8  | 894.0  |
| 32.5°  | 1105.3 | 1045.9 | 940.4  | 863.1  | 830.8  |
| 35°    | 1058.9 | 993.2  | 879.9  | 798.7  | 770.2  |
| 37.5°  | 1013.8 | 942.9  | 823.1  | 734.2  | 702.1  |
| 40°    | 966.1  | 888.9  | 763.9  | 672.4  | 638.9  |
| 42.5°  | 917.1  | 834.7  | 704.6  | 609.2  | 577.1  |
| 45°    | 865.6  | 779.3  | 644.1  | 552.6  | 521.7  |
| 47.5°  | 816.7  | 725.3  | 586.2  | 494.6  | 466.3  |
| 50°    | 762.6  | 671.1  | 529.4  | 440.5  | 413.5  |
| 52.5°  | 709.7  | 613.1  | 475.4  | 390.3  | 365.8  |
| 55°    | 658.2  | 557.8  | 418.6  | 341.4  | 316.9  |
| 57.5°  | 605.5  | 502.4  | 368.4  | 296.3  | 275.7  |
| 60°    | 551.3  | 448.2  | 315.6  | 249.9  | 229.4  |
| 62.5°  | 498.6  | 395.5  | 270.4  | 208.7  | 198.5  |
| 65°    | 444.4  | 340.0  | 224.1  | 180.4  | 176.4  |
| 67.5°  | 393.0  | 288.5  | 180.4  | 158.4  | 154.5  |
| 70°    | 338.8  | 238.3  | 149.4  | 136.6  | 131.3  |
| 72.5°  | 287.3  | 191.9  | 124.9  | 114.7  | 112.1  |
| 75°    | 236.9  | 146.8  | 103.1  | 94.0   | 92.8   |
| 77.5°  | 186.8  | 104.3  | 81.2   | 76.0   | 73.4   |
| 80°    | 140.3  | 74.7   | 61.7   | 56.7   | 56.7   |
| 82.5°  | 97.9   | 50.3   | 42.5   | 39.9   | 39.9   |
| 85°    | 55.4   | 28.3   | 24.5   | 24.5   | 24.5   |
| 87.5°  | 20.7   | 10.2   | 10.2   | 9.0    | 9.0    |
| 90°    | 1.7    | 20.7   | 56.3   | 52.9   | 54.6   |
| 92.5°  | 35.6   | 48.3   | 50.0   | 51.7   | 51.7   |
| 95°    | 83.9   | 100.0  | 102.9  | 102.9  | 100.0  |
| 97.5°  | 139.7  | 154.5  | 160.9  | 160.9  | 160.9  |
| 100°   | 204.0  | 217.2  | 221.8  | 221.8  | 220.1  |
| 102.5° | 271.8  | 281.5  | 287.9  | 289.6  | 287.9  |
| 105°   | 345.9  | 350.5  | 354.0  | 356.9  | 356.9  |
| 107.5° | 419.5  | 426.4  | 426.4  | 427.6  | 419.5  |
| 110°   | 490.8  | 500.0  | 500.0  | 500.0  | 495.3  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 567.7  | 577.6  | 575.8  | 571.2  | 567.7  |
| 115°   | 643.6  | 652.8  | 650.0  | 648.2  | 643.6  |
| 117.5° | 718.8  | 731.5  | 723.5  | 718.8  | 714.3  |
| 120°   | 794.7  | 807.4  | 794.7  | 794.7  | 789.5  |
| 122.5° | 863.7  | 879.8  | 871.8  | 867.1  | 863.7  |
| 125°   | 936.1  | 950.5  | 945.9  | 940.7  | 939.0  |
| 127.5° | 1006.8 | 1024.6 | 1018.3 | 1011.4 | 1006.8 |
| 130°   | 1072.9 | 1093.6 | 1090.7 | 1087.3 | 1080.9 |
| 132.5° | 1147.0 | 1163.1 | 1164.2 | 1156.2 | 1151.6 |
| 135°   | 1210.8 | 1228.6 | 1232.1 | 1230.3 | 1225.7 |
| 137.5° | 1282.0 | 1296.4 | 1299.2 | 1298.1 | 1291.2 |
| 140°   | 1344.7 | 1359.1 | 1367.1 | 1367.1 | 1360.8 |
| 142.5° | 1409.0 | 1423.4 | 1428.0 | 1429.7 | 1423.4 |
| 145°   | 1470.0 | 1481.4 | 1490.6 | 1492.4 | 1486.1 |
| 147.5° | 1524.6 | 1538.9 | 1545.8 | 1548.7 | 1542.4 |
| 150°   | 1580.9 | 1590.6 | 1597.0 | 1602.1 | 1597.0 |
| 152.5° | 1630.8 | 1640.6 | 1648.6 | 1655.0 | 1648.6 |
| 155°   | 1680.8 | 1685.4 | 1690.7 | 1698.7 | 1693.5 |
| 157.5° | 1724.0 | 1727.4 | 1730.3 | 1741.8 | 1733.7 |
| 160°   | 1762.5 | 1765.9 | 1767.6 | 1777.4 | 1770.5 |
| 162.5° | 1798.1 | 1798.1 | 1799.8 | 1810.7 | 1802.7 |
| 165°   | 1828.5 | 1826.8 | 1826.8 | 1838.3 | 1830.2 |
| 167.5° | 1856.1 | 1851.0 | 1851.0 | 1862.4 | 1854.4 |
| 170°   | 1876.8 | 1872.2 | 1870.5 | 1882.0 | 1872.2 |
| 172.5° | 1891.2 | 1886.5 | 1884.8 | 1896.3 | 1886.5 |
| 175°   | 1902.6 | 1898.1 | 1894.6 | 1906.1 | 1896.3 |
| 177.5° | 1909.0 | 1904.4 | 1900.9 | 1910.7 | 1900.9 |
| 180°   | 1906.1 | 1906.1 | 1906.1 | 1906.1 | 1906.1 |

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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 | 7.28             | 8.01  | 8.36  | 9.08  | 10.55 | 3.24           | 3.97 | 4.32 | 5.04 | 6.51 |
|                 | 3H   | 8.95             | 9.60  | 10.04 | 10.68 | 12.16 | 4.42           | 5.07 | 5.50 | 6.15 | 7.63 |
|                 | 4H   | 9.55             | 10.16 | 10.65 | 11.25 | 12.74 | 4.86           | 5.47 | 5.96 | 6.56 | 8.05 |
|                 | 6H   | 9.96             | 10.53 | 11.07 | 11.61 | 13.12 | 5.17           | 5.73 | 6.27 | 6.82 | 8.32 |
|                 | 8H   | 10.08            | 10.62 | 11.19 | 11.72 | 13.22 | 5.25           | 5.79 | 6.36 | 6.89 | 8.39 |
|                 | 12H  | 10.14            | 10.65 | 11.25 | 11.75 | 13.26 | 5.29           | 5.80 | 6.40 | 6.90 | 8.42 |
| 4H              | 2H   | 7.29             | 7.90  | 8.39  | 8.99  | 10.48 | 3.82           | 4.44 | 4.93 | 5.52 | 7.01 |
|                 | 3H   | 9.10             | 9.61  | 10.21 | 10.72 | 12.23 | 5.16           | 5.67 | 6.27 | 6.78 | 8.28 |
|                 | 4H   | 9.78             | 10.25 | 10.90 | 11.35 | 12.88 | 5.70           | 6.16 | 6.81 | 7.27 | 8.79 |
|                 | 6H   | 10.29            | 10.69 | 11.41 | 11.82 | 13.33 | 6.10           | 6.50 | 7.22 | 7.63 | 9.14 |
|                 | 8H   | 10.46            | 10.83 | 11.58 | 11.95 | 13.48 | 6.22           | 6.60 | 7.35 | 7.72 | 9.25 |
|                 | 12H  | 10.55            | 10.89 | 11.69 | 12.02 | 13.55 | 6.28           | 6.62 | 7.42 | 7.75 | 9.29 |
| 8H              | 4H   | 9.74             | 10.12 | 10.87 | 11.23 | 12.77 | 5.96           | 6.34 | 7.09 | 7.46 | 8.99 |
|                 | 6H   | 10.30            | 10.61 | 11.44 | 11.77 | 13.30 | 6.47           | 6.78 | 7.61 | 7.94 | 9.47 |
|                 | 8H   | 10.51            | 10.78 | 11.66 | 11.92 | 13.47 | 6.66           | 6.93 | 7.81 | 8.06 | 9.61 |
|                 | 12H  | 10.64            | 10.88 | 11.80 | 12.02 | 13.60 | 6.77           | 7.00 | 7.92 | 8.14 | 9.72 |
| 12H             | 4H   | 9.69             | 10.03 | 10.83 | 11.16 | 12.69 | 5.96           | 6.30 | 7.10 | 7.43 | 8.97 |
|                 | 6H   | 10.27            | 10.54 | 11.42 | 11.68 | 13.23 | 6.52           | 6.79 | 7.67 | 7.93 | 9.48 |
|                 | 8H   | 10.49            | 10.72 | 11.64 | 11.86 | 13.44 | 6.72           | 6.96 | 7.87 | 8.09 | 9.68 |

END OF REPORT