

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: P916816

Luminaire Tested: DFN2DIP-PN4F0-040D120US930-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P916816  
REPORT IS A COMBINATION OF REPORTS P899753 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-040D120US930-FLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

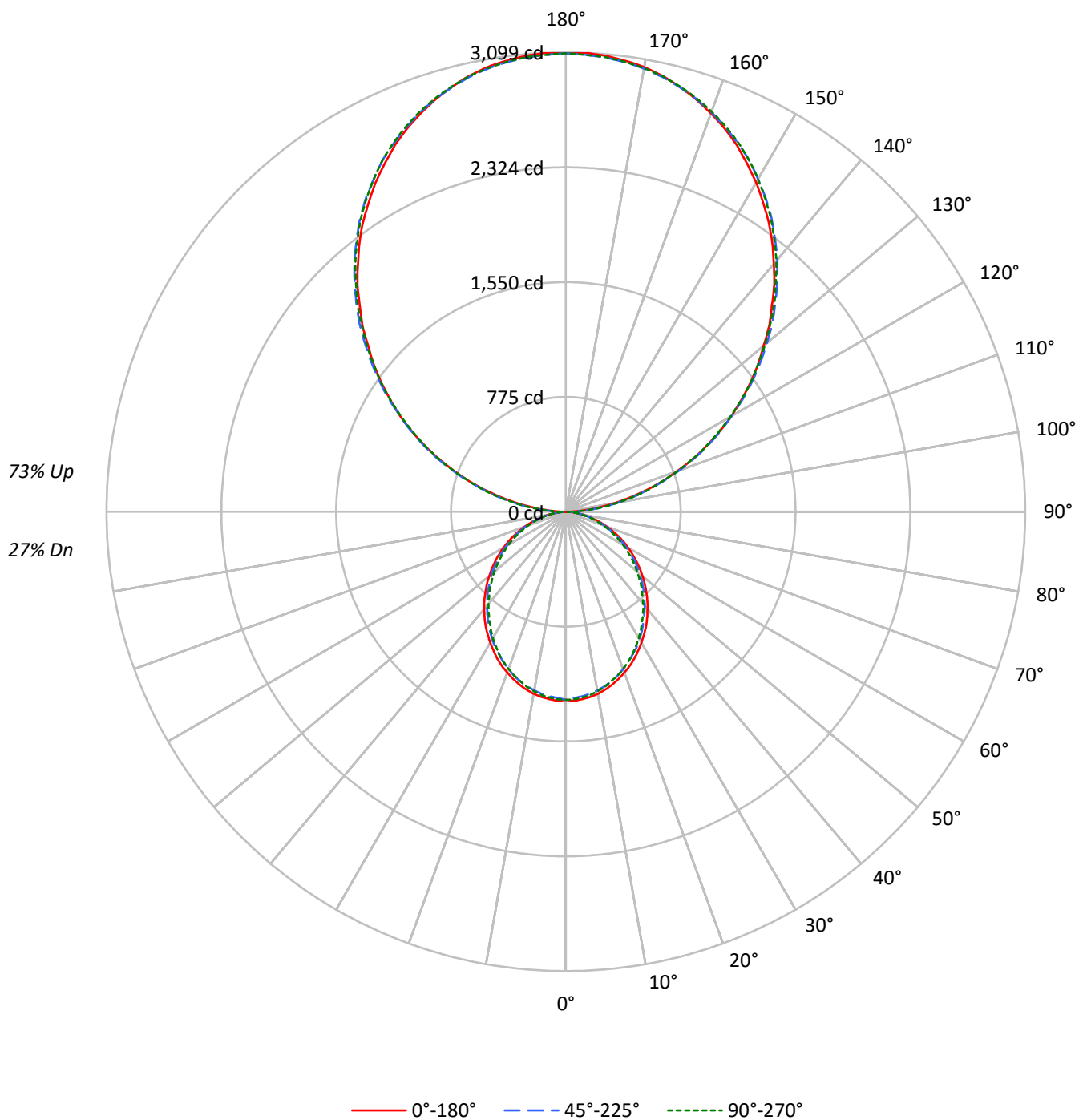
Lumens per Lamp: N/A  
Luminaire Lumens: 11887.0 lumens  
Efficiency: N/A  
Efficacy: 86.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 136.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9968  
Total Harmonic Distortion (THDi): 0.064  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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CATALOG NUMBER: DFN2DIP-PN4F0-040D120US930-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P916816

CATALOG NUMBER: DFN2DIP-PN4F0-040D120US930-FLLFL

**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 | 91 | 91 | 91 | 91 | 71 | 71 | 71 | 52 | 52 | 52 | 35 | 35 | 35 |
| 1   | 93  | 88  | 85  | 81  | 83 | 79 | 76 | 73 | 62 | 60 | 58 | 46 | 44 | 43 | 31 | 30 | 30 |
| 2   | 84  | 77  | 71  | 66  | 75 | 69 | 64 | 60 | 54 | 51 | 48 | 40 | 38 | 36 | 27 | 26 | 25 |
| 3   | 77  | 68  | 61  | 55  | 68 | 61 | 55 | 50 | 48 | 44 | 40 | 35 | 33 | 30 | 24 | 23 | 21 |
| 4   | 70  | 60  | 52  | 47  | 62 | 54 | 47 | 42 | 42 | 38 | 34 | 32 | 29 | 26 | 22 | 20 | 18 |
| 5   | 64  | 53  | 45  | 40  | 57 | 48 | 41 | 36 | 38 | 33 | 29 | 28 | 25 | 22 | 19 | 17 | 16 |
| 6   | 59  | 48  | 40  | 34  | 53 | 43 | 36 | 31 | 34 | 29 | 25 | 25 | 22 | 20 | 18 | 16 | 14 |
| 7   | 55  | 43  | 35  | 30  | 49 | 39 | 32 | 27 | 31 | 26 | 22 | 23 | 20 | 17 | 16 | 14 | 12 |
| 8   | 51  | 39  | 31  | 26  | 45 | 35 | 28 | 24 | 28 | 23 | 20 | 21 | 18 | 15 | 15 | 13 | 11 |
| 9   | 47  | 35  | 28  | 23  | 42 | 32 | 26 | 21 | 25 | 21 | 17 | 19 | 16 | 14 | 14 | 11 | 10 |
| 10  | 44  | 32  | 25  | 21  | 39 | 29 | 23 | 19 | 23 | 19 | 16 | 18 | 15 | 12 | 13 | 10 | 9  |

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

|     | 0°  | 45° | 90° |
|-----|-----|-----|-----|
| 0°  | 926 | 926 | 926 |
| 5°  | 928 | 914 | 920 |
| 10° | 920 | 901 | 907 |
| 15° | 907 | 887 | 888 |
| 20° | 888 | 866 | 868 |
| 25° | 870 | 842 | 845 |
| 30° | 847 | 819 | 816 |
| 35° | 826 | 792 | 786 |
| 40° | 799 | 765 | 756 |
| 45° | 773 | 737 | 726 |
| 50° | 744 | 709 | 692 |
| 55° | 713 | 676 | 660 |
| 60° | 679 | 636 | 623 |
| 65° | 642 | 596 | 580 |
| 70° | 594 | 546 | 534 |
| 75° | 528 | 487 | 491 |
| 80° | 449 | 411 | 410 |
| 85° | 325 | 281 | 274 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2422 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 119.4   | 1.0       |
| 10°-20°   | 336.0   | 2.8       |
| 20°-30°   | 493.8   | 4.2       |
| 30°-40°   | 573.6   | 4.8       |
| 40°-50°   | 572.9   | 4.8       |
| 50°-60°   | 499.5   | 4.2       |
| 60°-70°   | 369.3   | 3.1       |
| 70°-80°   | 208.9   | 1.8       |
| 80°-90°   | 63.9    | 0.5       |
| 90°-100°  | 191.5   | 1.6       |
| 100°-110° | 608.3   | 5.1       |
| 110°-120° | 1041.1  | 8.8       |
| 120°-130° | 1369.2  | 11.5      |
| 130°-140° | 1536.9  | 12.9      |
| 140°-150° | 1507.1  | 12.7      |
| 150°-160° | 1264.2  | 10.6      |
| 160°-170° | 838.4   | 7.1       |
| 170°-180° | 293.0   | 2.5       |
| 0°-30°    | 949.3   | 8.0       |
| 0°-40°    | 1522.9  | 12.8      |
| 0°-60°    | 2595.3  | 21.8      |
| 0°-90°    | 3237.4  | 27.2      |
| 90°-120°  | 1840.9  | 15.5      |
| 90°-150°  | 6254.0  | 52.6      |
| 90°-180°  | 8650.0  | 72.8      |
| 0°-180°   | 11887.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1269 | 1269  | 1269 | 1269  | 1269 |      |
| 5°   | 1269 | 1264  | 1251 | 1260  | 1258 | 120  |
| 15°  | 1208 | 1201  | 1185 | 1190  | 1184 | 340  |
| 25°  | 1093 | 1084  | 1063 | 1065  | 1063 | 503  |
| 35°  | 943  | 931   | 912  | 904   | 898  | 589  |
| 45°  | 768  | 759   | 741  | 727   | 722  | 592  |
| 55°  | 581  | 574   | 559  | 544   | 538  | 519  |
| 65°  | 392  | 384   | 372  | 361   | 355  | 387  |
| 75°  | 205  | 203   | 196  | 189   | 192  | 219  |
| 85°  | 50   | 49    | 48   | 44    | 43   | 56   |
| 90°  | 3    | 34    | 91   | 86    | 89   | 12   |
| 95°  | 136  | 162   | 167  | 167   | 162  | 152  |
| 105° | 562  | 569   | 575  | 579   | 579  | 593  |
| 115° | 1045 | 1060  | 1055 | 1052  | 1045 | 1033 |
| 125° | 1520 | 1543  | 1536 | 1527  | 1524 | 1358 |
| 135° | 1965 | 1994  | 2000 | 1997  | 1990 | 1519 |
| 145° | 2386 | 2405  | 2420 | 2423  | 2412 | 1491 |
| 155° | 2728 | 2736  | 2744 | 2757  | 2749 | 1256 |
| 165° | 2968 | 2966  | 2966 | 2984  | 2971 | 837  |
| 175° | 3089 | 3081  | 3076 | 3094  | 3078 | 293  |
| 180° | 3094 | 3094  | 3094 | 3094  | 3094 |      |

TEST NUMBER: P916816

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1268.9 | 1268.9 | 1268.9 | 1268.9 | 1268.9 |
| 2.5°   | 1276.3 | 1270.2 | 1256.8 | 1268.9 | 1266.6 |
| 5°     | 1268.9 | 1264.1 | 1250.7 | 1260.4 | 1258.1 |
| 7.5°   | 1260.4 | 1253.1 | 1239.7 | 1249.5 | 1247.1 |
| 10°    | 1247.1 | 1238.5 | 1223.9 | 1233.6 | 1230.0 |
| 12.5°  | 1228.7 | 1221.4 | 1206.8 | 1212.9 | 1210.4 |
| 15°    | 1207.9 | 1200.7 | 1184.8 | 1189.7 | 1183.6 |
| 17.5°  | 1182.3 | 1175.1 | 1159.2 | 1165.2 | 1159.2 |
| 20°    | 1154.2 | 1147.0 | 1129.9 | 1133.5 | 1128.8 |
| 22.5°  | 1126.3 | 1115.2 | 1099.3 | 1099.3 | 1096.9 |
| 25°    | 1093.2 | 1083.5 | 1062.8 | 1065.2 | 1062.8 |
| 27.5°  | 1056.6 | 1048.1 | 1032.3 | 1028.7 | 1022.6 |
| 30°    | 1020.1 | 1010.3 | 992.1  | 988.4  | 983.5  |
| 32.5°  | 981.0  | 973.8  | 954.2  | 946.9  | 941.9  |
| 35°    | 943.2  | 931.1  | 911.5  | 904.2  | 898.1  |
| 37.5°  | 900.5  | 889.5  | 869.9  | 861.4  | 855.3  |
| 40°    | 856.6  | 846.8  | 827.2  | 816.4  | 811.5  |
| 42.5°  | 813.9  | 804.0  | 784.6  | 772.3  | 765.1  |
| 45°    | 767.5  | 759.0  | 740.6  | 727.3  | 722.4  |
| 47.5°  | 722.4  | 713.8  | 694.3  | 680.9  | 673.6  |
| 50°    | 674.7  | 668.6  | 651.6  | 634.5  | 628.4  |
| 52.5°  | 628.4  | 619.9  | 604.1  | 590.6  | 582.0  |
| 55°    | 580.9  | 573.5  | 558.9  | 544.2  | 538.2  |
| 57.5°  | 533.2  | 527.2  | 511.2  | 496.6  | 491.7  |
| 60°    | 485.6  | 480.8  | 463.7  | 450.3  | 446.6  |
| 62.5°  | 439.3  | 430.7  | 418.6  | 406.3  | 401.5  |
| 65°    | 391.8  | 384.3  | 372.2  | 361.2  | 355.1  |
| 67.5°  | 342.9  | 336.7  | 325.9  | 317.3  | 312.4  |
| 70°    | 297.7  | 292.9  | 281.8  | 273.3  | 268.5  |
| 72.5°  | 251.4  | 246.5  | 240.4  | 231.9  | 228.2  |
| 75°    | 205.0  | 202.6  | 196.4  | 189.1  | 191.6  |
| 77.5°  | 163.5  | 158.6  | 156.1  | 152.5  | 148.9  |
| 80°    | 122.1  | 120.7  | 118.3  | 114.7  | 112.3  |
| 82.5°  | 83.0   | 83.0   | 81.9   | 76.9   | 76.9   |
| 85°    | 50.0   | 48.8   | 47.6   | 43.9   | 42.7   |
| 87.5°  | 22.0   | 19.6   | 17.1   | 13.5   | 12.1   |
| 90°    | 2.8    | 33.6   | 91.4   | 85.9   | 88.6   |
| 92.5°  | 57.8   | 78.4   | 81.1   | 84.0   | 84.0   |
| 95°    | 136.2  | 162.3  | 167.0  | 167.0  | 162.3  |
| 97.5°  | 226.7  | 250.9  | 261.2  | 261.2  | 261.2  |
| 100°   | 331.2  | 352.6  | 360.0  | 360.0  | 357.3  |
| 102.5° | 441.2  | 457.1  | 467.3  | 470.2  | 467.3  |
| 105°   | 561.6  | 569.0  | 574.6  | 579.3  | 579.3  |
| 107.5° | 680.9  | 692.2  | 692.2  | 694.0  | 680.9  |
| 110°   | 796.6  | 811.5  | 811.5  | 811.5  | 804.1  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 921.6  | 937.5  | 934.7  | 927.2  | 921.6  |
| 115°   | 1044.7 | 1059.7 | 1055.0 | 1052.2 | 1044.7 |
| 117.5° | 1166.9 | 1187.5 | 1174.4 | 1166.9 | 1159.5 |
| 120°   | 1290.1 | 1310.6 | 1290.1 | 1290.1 | 1281.7 |
| 122.5° | 1402.1 | 1428.2 | 1415.1 | 1407.6 | 1402.1 |
| 125°   | 1519.6 | 1542.9 | 1535.5 | 1527.1 | 1524.2 |
| 127.5° | 1634.3 | 1663.2 | 1652.9 | 1641.8 | 1634.3 |
| 130°   | 1741.6 | 1775.1 | 1770.5 | 1764.9 | 1754.6 |
| 132.5° | 1861.9 | 1888.1 | 1889.9 | 1876.8 | 1869.4 |
| 135°   | 1965.4 | 1994.4 | 2000.0 | 1997.2 | 1989.7 |
| 137.5° | 2081.1 | 2104.4 | 2109.1 | 2107.2 | 2096.1 |
| 140°   | 2182.8 | 2206.1 | 2219.2 | 2219.2 | 2208.9 |
| 142.5° | 2287.3 | 2310.6 | 2318.1 | 2320.8 | 2310.6 |
| 145°   | 2386.1 | 2404.8 | 2419.7 | 2422.6 | 2412.3 |
| 147.5° | 2474.8 | 2498.1 | 2509.3 | 2514.0 | 2503.7 |
| 150°   | 2566.2 | 2582.0 | 2592.3 | 2600.7 | 2592.3 |
| 152.5° | 2647.4 | 2663.2 | 2676.3 | 2686.6 | 2676.3 |
| 155°   | 2728.5 | 2736.0 | 2744.4 | 2757.4 | 2749.0 |
| 157.5° | 2798.5 | 2804.1 | 2808.7 | 2827.4 | 2814.3 |
| 160°   | 2861.0 | 2866.6 | 2869.4 | 2885.3 | 2874.0 |
| 162.5° | 2918.8 | 2918.8 | 2921.6 | 2939.3 | 2926.3 |
| 165°   | 2968.3 | 2965.5 | 2965.5 | 2984.1 | 2971.0 |
| 167.5° | 3013.0 | 3004.6 | 3004.6 | 3023.3 | 3010.2 |
| 170°   | 3046.6 | 3039.1 | 3036.3 | 3055.0 | 3039.1 |
| 172.5° | 3069.9 | 3062.4 | 3059.7 | 3078.3 | 3062.4 |
| 175°   | 3088.6 | 3081.1 | 3075.5 | 3094.1 | 3078.3 |
| 177.5° | 3098.9 | 3091.4 | 3085.7 | 3101.6 | 3085.7 |
| 180°   | 3094.1 | 3094.1 | 3094.1 | 3094.1 | 3094.1 |

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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 | 4.40             | 5.09 | 5.53 | 6.21 | 7.78  | 3.96           | 4.65 | 5.09 | 5.77 | 7.34  |
|                 | 3H   | 6.05             | 6.67 | 7.19 | 7.80 | 9.38  | 5.57           | 6.18 | 6.71 | 7.32 | 8.89  |
|                 | 4H   | 6.63             | 7.22 | 7.78 | 8.35 | 9.93  | 6.15           | 6.73 | 7.29 | 7.86 | 9.45  |
|                 | 6H   | 7.03             | 7.57 | 8.18 | 8.70 | 10.29 | 6.53           | 7.07 | 7.69 | 8.21 | 9.80  |
|                 | 8H   | 7.13             | 7.64 | 8.29 | 8.79 | 10.38 | 6.63           | 7.15 | 7.79 | 8.30 | 9.88  |
|                 | 12H  | 7.17             | 7.66 | 8.33 | 8.80 | 10.41 | 6.67           | 7.16 | 7.83 | 8.30 | 9.91  |
| 4H              | 2H   | 4.84             | 5.43 | 6.00 | 6.56 | 8.14  | 4.49           | 5.08 | 5.65 | 6.21 | 7.79  |
|                 | 3H   | 6.70             | 7.18 | 7.86 | 8.34 | 9.94  | 6.29           | 6.78 | 7.45 | 7.94 | 9.53  |
|                 | 4H   | 7.41             | 7.86 | 8.57 | 9.00 | 10.62 | 6.99           | 7.44 | 8.15 | 8.58 | 10.20 |
|                 | 6H   | 7.91             | 8.30 | 9.08 | 9.47 | 11.07 | 7.49           | 7.87 | 8.66 | 9.04 | 10.65 |
|                 | 8H   | 8.06             | 8.42 | 9.23 | 9.58 | 11.20 | 7.63           | 7.99 | 8.80 | 9.15 | 10.77 |
|                 | 12H  | 8.13             | 8.45 | 9.31 | 9.62 | 11.25 | 7.69           | 8.01 | 8.87 | 9.18 | 10.81 |
| 8H              | 4H   | 7.59             | 7.95 | 8.76 | 9.11 | 10.73 | 7.22           | 7.58 | 8.38 | 8.74 | 10.36 |
|                 | 6H   | 8.21             | 8.51 | 9.40 | 9.71 | 11.33 | 7.84           | 8.14 | 9.03 | 9.34 | 10.96 |
|                 | 8H   | 8.44             | 8.69 | 9.63 | 9.87 | 11.51 | 8.05           | 8.31 | 9.24 | 9.49 | 11.13 |
|                 | 12H  | 8.56             | 8.79 | 9.76 | 9.97 | 11.64 | 8.16           | 8.39 | 9.36 | 9.56 | 11.24 |
| 12H             | 4H   | 7.56             | 7.89 | 8.75 | 9.06 | 10.69 | 7.20           | 7.53 | 8.39 | 8.70 | 10.33 |
|                 | 6H   | 8.24             | 8.50 | 9.44 | 9.68 | 11.32 | 7.88           | 8.14 | 9.07 | 9.32 | 10.96 |
|                 | 8H   | 8.48             | 8.71 | 9.68 | 9.88 | 11.56 | 8.11           | 8.33 | 9.30 | 9.51 | 11.18 |

END OF REPORT