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## Photometric Test Report

Relevant Standards  
IES LM-79-2008, IES LM-20-2013  
ANSI C82.77-2002

Prepared For  
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Catalog Number  
**zPAR38302512T3N**  
Order Number  
10585963  
Test Number  
830250

Test Date

11/26/2014 - 11/29/2014

Prepared By

Handwritten signature of Jeffrey Lockner in black ink.

Jeffrey Lockner, Project Engineer

Approved By

Handwritten signature of Jeff A. Smith Jr. in black ink.

Jeff Smith Jr., Project Handler

The results contained in this report pertain only to the tested sample.  
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**Luminaire Description:** Molded plastic housing, formed aluminum heatsink patterned plastic optic / enclosure  
**Lamp:** Three white LEDs  
**Mounting:** VBU

**Luminaire**



**Luminaire Characteristics**

Luminous Diameter: 2.75 in.

**Summary of Results**

**Integrating Sphere**

Luminous Flux: 1183 Lumens  
 Efficacy: 96.2 lm/w  
 CCT: 3050 K  
 CRI (Ra): 83.9

**Distribution**

Total Luminaire Output: 1156 Lumens  
 Luminaire Efficacy: 94.2 lm/w  
 Maximum Candela: 5397 Candela

**Electrical Data at 120 VAC**

Test Temperature: 24.9 °C  
 Voltage: 120.0 VAC  
 Current: 0.1048 A  
 Power: 12.29 W  
 Power Factor: 0.976  
 Frequency: 60 Hz  
 Current THD: 17.1 %



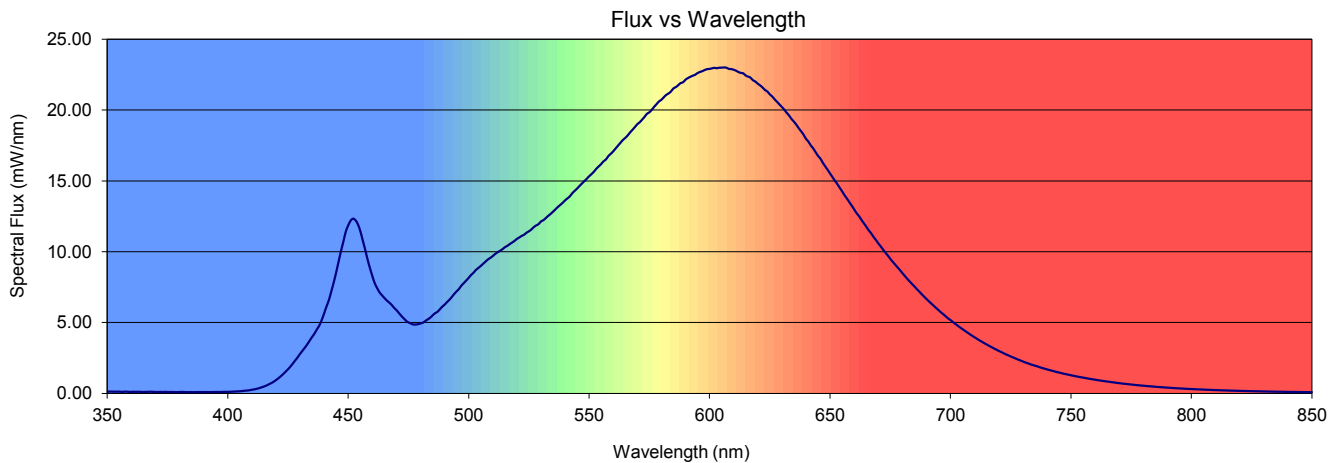
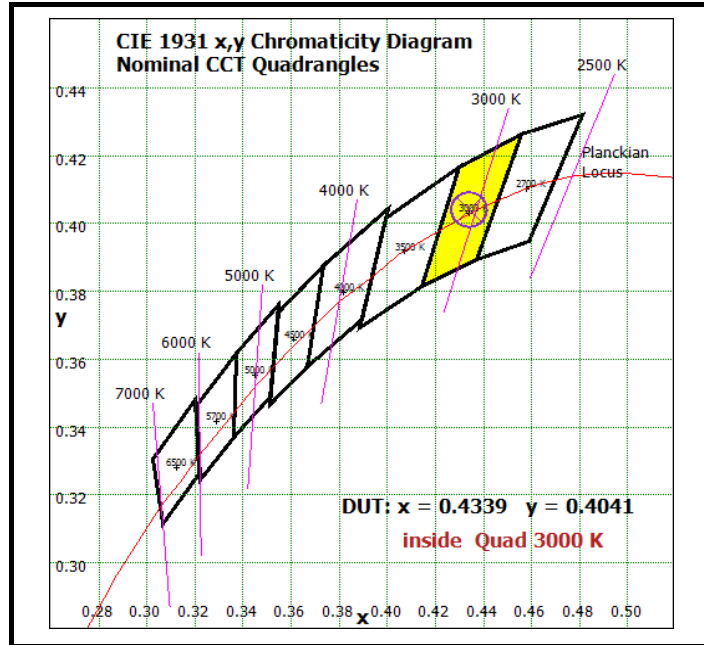
### Color Quality - Integrating Sphere

#### Integrating Sphere Test Conditions

| Temperature | Voltage   | Current  | Power   | Power Factor | Frequency | Current THD |
|-------------|-----------|----------|---------|--------------|-----------|-------------|
| 24.9 °C     | 120.0 VAC | 0.1048 A | 12.29 W | 0.976        | 60 Hz     | 17.1 %      |

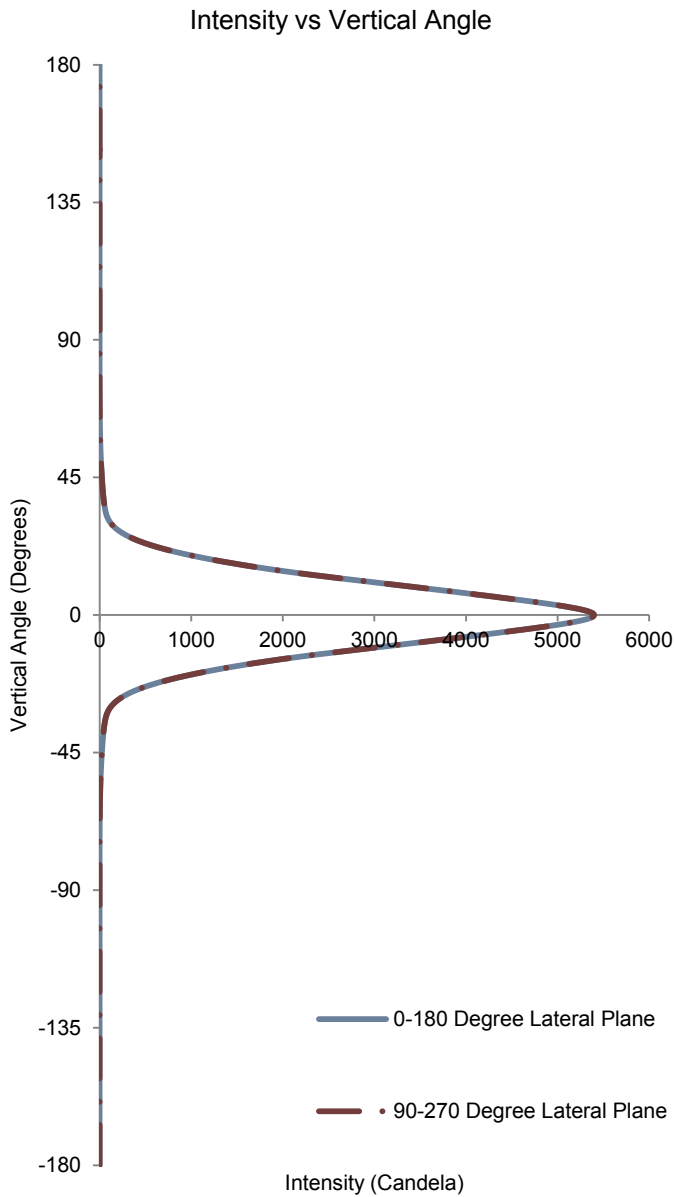
#### Summary of Results

|                   |             |
|-------------------|-------------|
| Luminous Flux:    | 1183 Lumens |
| Efficacy:         | 96.2 lm/w   |
| CCT:              | 3050 K      |
| CRI (Ra):         | 83.9        |
| CRI (R9):         | 18.5        |
| Chromaticity (x): | 0.4339      |
| Chromaticity (y): | 0.4041      |
| Chromaticity (u): | 0.2486      |
| Chromaticity (v): | 0.3473      |
| Chromaticity (u') | 0.2486      |
| Chromaticity (v') | 0.5209      |
| Duv:              | 0.0004      |





### Distribution - Goniophotometer



| Test Conditions                        |           |
|----------------------------------------|-----------|
| Test Temperature:                      | 24.6 °C   |
| Voltage:                               | 120.0 VAC |
| Current:                               | 0.1048 A  |
| Power:                                 | 12.28 W   |
| Power Factor:                          | 0.976     |
| Frequency:                             | 60 Hz     |
| Current THD:                           | 17.1 %    |
| Total Lumen Output: 1156 Lumens        |           |
| Luminaire Efficacy: 94.2 Lumens/Watt   |           |
| CIE Type: Direct                       |           |
| Spacing Criterion: 0.40 All Directions |           |
| Center Beam Intensity: 5397 Candela    |           |
| Central Cone Intensity: 5077 Candela   |           |
| Beam Flux: 497.6 Lumens                |           |
| Beam Angle 0-180: 23.5 Degrees         |           |
| Beam Angle 90-270: 23.5 Degrees        |           |
| Field Angle 0-180: 46.1 Degrees        |           |
| Field Angle 90-270: 46.1 Degrees       |           |

Data was acquired using the calibrated photodetector method of absolute photometry.



Candela Tabulation

Lateral Angle (Degrees)

Vertical Angle (Degrees)

|     | 0    | 22.5 | 45   | 67.5 | 90   | 112.5 | 135  | 157.5 | 180  | 202.5 | 225  | 247.5 | 270  | 292.5 | 315  | 337.5 |
|-----|------|------|------|------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|
| 0   | 5397 | 5397 | 5397 | 5397 | 5397 | 5397  | 5397 | 5397  | 5397 | 5397  | 5397 | 5397  | 5397 | 5397  | 5397 | 5397  |
| 1   | 5353 | 5353 | 5353 | 5353 | 5353 | 5353  | 5353 | 5353  | 5353 | 5353  | 5353 | 5353  | 5353 | 5353  | 5353 | 5353  |
| 2   | 5228 | 5228 | 5228 | 5228 | 5228 | 5228  | 5228 | 5228  | 5228 | 5228  | 5228 | 5228  | 5228 | 5228  | 5228 | 5228  |
| 3   | 5042 | 5042 | 5042 | 5042 | 5042 | 5042  | 5042 | 5042  | 5042 | 5042  | 5042 | 5042  | 5042 | 5042  | 5042 | 5042  |
| 4   | 4814 | 4814 | 4814 | 4814 | 4814 | 4814  | 4814 | 4814  | 4814 | 4814  | 4814 | 4814  | 4814 | 4814  | 4814 | 4814  |
| 5   | 4564 | 4564 | 4564 | 4564 | 4564 | 4564  | 4564 | 4564  | 4564 | 4564  | 4564 | 4564  | 4564 | 4564  | 4564 | 4564  |
| 6   | 4304 | 4304 | 4304 | 4304 | 4304 | 4304  | 4304 | 4304  | 4304 | 4304  | 4304 | 4304  | 4304 | 4304  | 4304 | 4304  |
| 7   | 4034 | 4034 | 4034 | 4034 | 4034 | 4034  | 4034 | 4034  | 4034 | 4034  | 4034 | 4034  | 4034 | 4034  | 4034 | 4034  |
| 8   | 3759 | 3759 | 3759 | 3759 | 3759 | 3759  | 3759 | 3759  | 3759 | 3759  | 3759 | 3759  | 3759 | 3759  | 3759 | 3759  |
| 9   | 3480 | 3480 | 3480 | 3480 | 3480 | 3480  | 3480 | 3480  | 3480 | 3480  | 3480 | 3480  | 3480 | 3480  | 3480 | 3480  |
| 10  | 3196 | 3196 | 3196 | 3196 | 3196 | 3196  | 3196 | 3196  | 3196 | 3196  | 3196 | 3196  | 3196 | 3196  | 3196 | 3196  |
| 11  | 2910 | 2910 | 2910 | 2910 | 2910 | 2910  | 2910 | 2910  | 2910 | 2910  | 2910 | 2910  | 2910 | 2910  | 2910 | 2910  |
| 12  | 2627 | 2627 | 2627 | 2627 | 2627 | 2627  | 2627 | 2627  | 2627 | 2627  | 2627 | 2627  | 2627 | 2627  | 2627 | 2627  |
| 13  | 2353 | 2353 | 2353 | 2353 | 2353 | 2353  | 2353 | 2353  | 2353 | 2353  | 2353 | 2353  | 2353 | 2353  | 2353 | 2353  |
| 14  | 2097 | 2097 | 2097 | 2097 | 2097 | 2097  | 2097 | 2097  | 2097 | 2097  | 2097 | 2097  | 2097 | 2097  | 2097 | 2097  |
| 15  | 1859 | 1859 | 1859 | 1859 | 1859 | 1859  | 1859 | 1859  | 1859 | 1859  | 1859 | 1859  | 1859 | 1859  | 1859 | 1859  |
| 16  | 1639 | 1639 | 1639 | 1639 | 1639 | 1639  | 1639 | 1639  | 1639 | 1639  | 1639 | 1639  | 1639 | 1639  | 1639 | 1639  |
| 17  | 1438 | 1438 | 1438 | 1438 | 1438 | 1438  | 1438 | 1438  | 1438 | 1438  | 1438 | 1438  | 1438 | 1438  | 1438 | 1438  |
| 18  | 1251 | 1251 | 1251 | 1251 | 1251 | 1251  | 1251 | 1251  | 1251 | 1251  | 1251 | 1251  | 1251 | 1251  | 1251 | 1251  |
| 19  | 1078 | 1078 | 1078 | 1078 | 1078 | 1078  | 1078 | 1078  | 1078 | 1078  | 1078 | 1078  | 1078 | 1078  | 1078 | 1078  |
| 20  | 922  | 922  | 922  | 922  | 922  | 922   | 922  | 922   | 922  | 922   | 922  | 922   | 922  | 922   | 922  | 922   |
| 25  | 366  | 366  | 366  | 366  | 366  | 366   | 366  | 366   | 366  | 366   | 366  | 366   | 366  | 366   | 366  | 366   |
| 30  | 124  | 124  | 124  | 124  | 124  | 124   | 124  | 124   | 124  | 124   | 124  | 124   | 124  | 124   | 124  | 124   |
| 35  | 57   | 57   | 57   | 57   | 57   | 57    | 57   | 57    | 57   | 57    | 57   | 57    | 57   | 57    | 57   | 57    |
| 40  | 37   | 37   | 37   | 37   | 37   | 37    | 37   | 37    | 37   | 37    | 37   | 37    | 37   | 37    | 37   | 37    |
| 45  | 25   | 25   | 25   | 25   | 25   | 25    | 25   | 25    | 25   | 25    | 25   | 25    | 25   | 25    | 25   | 25    |
| 50  | 16   | 16   | 16   | 16   | 16   | 16    | 16   | 16    | 16   | 16    | 16   | 16    | 16   | 16    | 16   | 16    |
| 55  | 9    | 9    | 9    | 9    | 9    | 9     | 9    | 9     | 9    | 9     | 9    | 9     | 9    | 9     | 9    | 9     |
| 60  | 5    | 5    | 5    | 5    | 5    | 5     | 5    | 5     | 5    | 5     | 5    | 5     | 5    | 5     | 5    | 5     |
| 65  | 3    | 3    | 3    | 3    | 3    | 3     | 3    | 3     | 3    | 3     | 3    | 3     | 3    | 3     | 3    | 3     |
| 70  | 1    | 1    | 1    | 1    | 1    | 1     | 1    | 1     | 1    | 1     | 1    | 1     | 1    | 1     | 1    | 1     |
| 75  | 0    | 0    | 0    | 0    | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     |
| 80  | 0    | 0    | 0    | 0    | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     |
| 85  | 0    | 0    | 0    | 0    | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     |
| 90  | 0    | 0    | 0    | 0    | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     |
| 95  | 0    | 0    | 0    | 0    | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     |
| 100 | 0    | 0    | 0    | 0    | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     |
| 105 | 0    | 0    | 0    | 0    | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     |
| 110 | 0    | 0    | 0    | 0    | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     |
| 115 | 0    | 0    | 0    | 0    | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     |
| 120 | 0    | 0    | 0    | 0    | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     |
| 125 | 0    | 0    | 0    | 0    | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     |
| 130 | 0    | 0    | 0    | 0    | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     |
| 135 | 0    | 0    | 0    | 0    | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     |
| 140 | 0    | 0    | 0    | 0    | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     |
| 145 | 0    | 0    | 0    | 0    | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     |
| 150 | 0    | 0    | 0    | 0    | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     |
| 155 | 0    | 0    | 0    | 0    | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     |
| 160 | 0    | 0    | 0    | 0    | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     |
| 165 | 0    | 0    | 0    | 0    | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     |
| 170 | 0    | 0    | 0    | 0    | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     |
| 175 | 0    | 0    | 0    | 0    | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     |
| 180 | 0    | 0    | 0    | 0    | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    | 0     |



Utilization of Lumens - Zonal Cavity Method

| Effective Floor Cavity Reflectance 20% |                                                                    |      |      |      |      |      |      |      |      |      |      |      |
|----------------------------------------|--------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Ceiling Cavity Reflectance             | 90                                                                 |      |      |      | 80   |      |      |      | 70   |      |      |      |
| Wall Reflectance                       | 70                                                                 | 50   | 30   | 10   | 70   | 50   | 30   | 10   | 70   | 50   | 30   | 10   |
| Room Cavity Ratio (RCR)                | ** Values are expressed as Lumens delivered to the task surface ** |      |      |      |      |      |      |      |      |      |      |      |
| 0                                      | 1410                                                               | 1410 | 1410 | 1410 | 1376 | 1376 | 1376 | 1376 | 1344 | 1344 | 1344 | 1344 |
| 1                                      | 1358                                                               | 1329 | 1304 | 1282 | 1329 | 1304 | 1281 | 1261 | 1301 | 1279 | 1259 | 1241 |
| 2                                      | 1309                                                               | 1261 | 1222 | 1189 | 1284 | 1241 | 1206 | 1176 | 1260 | 1222 | 1190 | 1163 |
| 3                                      | 1263                                                               | 1202 | 1155 | 1119 | 1241 | 1186 | 1144 | 1110 | 1220 | 1171 | 1132 | 1101 |
| 4                                      | 1221                                                               | 1151 | 1100 | 1062 | 1202 | 1138 | 1091 | 1056 | 1183 | 1126 | 1083 | 1050 |
| 5                                      | 1181                                                               | 1105 | 1053 | 1014 | 1164 | 1095 | 1046 | 1010 | 1148 | 1085 | 1040 | 1006 |
| 6                                      | 1144                                                               | 1064 | 1011 | 974  | 1129 | 1056 | 1006 | 971  | 1115 | 1048 | 1001 | 968  |
| 7                                      | 1110                                                               | 1027 | 975  | 939  | 1097 | 1020 | 971  | 937  | 1084 | 1014 | 967  | 934  |
| 8                                      | 1078                                                               | 994  | 942  | 907  | 1066 | 988  | 939  | 906  | 1055 | 982  | 936  | 904  |
| 9                                      | 1047                                                               | 963  | 913  | 879  | 1037 | 958  | 910  | 878  | 1027 | 953  | 908  | 876  |
| 10                                     | 1019                                                               | 935  | 885  | 853  | 1009 | 931  | 883  | 852  | 1000 | 927  | 881  | 851  |

| Ceiling Cavity Reflectance | 50                                                                 |      |      |      | 30   |      |      | 10   |      |      | 0    |
|----------------------------|--------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|
| Wall Reflectance           | 70                                                                 | 50   | 30   | 10   | 50   | 30   | 10   | 50   | 30   | 10   | 0    |
| Room Cavity Ratio (RCR)    | ** Values are expressed as Lumens delivered to the task surface ** |      |      |      |      |      |      |      |      |      |      |
| 0                          | 1285                                                               | 1285 | 1285 | 1285 | 1230 | 1230 | 1230 | 1180 | 1180 | 1180 | 1156 |
| 1                          | 1250                                                               | 1233 | 1218 | 1203 | 1191 | 1179 | 1168 | 1152 | 1143 | 1134 | 1115 |
| 2                          | 1216                                                               | 1186 | 1160 | 1138 | 1153 | 1132 | 1114 | 1122 | 1106 | 1091 | 1074 |
| 3                          | 1182                                                               | 1142 | 1110 | 1084 | 1116 | 1090 | 1067 | 1091 | 1070 | 1052 | 1036 |
| 4                          | 1150                                                               | 1103 | 1066 | 1038 | 1081 | 1051 | 1026 | 1062 | 1036 | 1015 | 1001 |
| 5                          | 1119                                                               | 1066 | 1027 | 998  | 1049 | 1015 | 989  | 1033 | 1004 | 981  | 968  |
| 6                          | 1089                                                               | 1032 | 992  | 962  | 1018 | 983  | 956  | 1005 | 974  | 950  | 938  |
| 7                          | 1061                                                               | 1001 | 960  | 930  | 989  | 953  | 925  | 978  | 946  | 921  | 909  |
| 8                          | 1034                                                               | 972  | 930  | 901  | 962  | 924  | 897  | 952  | 919  | 894  | 882  |
| 9                          | 1008                                                               | 944  | 903  | 874  | 936  | 898  | 871  | 928  | 894  | 869  | 858  |
| 10                         | 984                                                                | 919  | 877  | 849  | 911  | 874  | 847  | 904  | 870  | 845  | 834  |

Average Luminance Table (cd/m<sup>2</sup>)

|                         |    | Horizontal Angle (Degrees) |         |         |
|-------------------------|----|----------------------------|---------|---------|
|                         |    | 0                          | 45      | 90      |
| Vertical Angle (Degree) | 0  | 1409000                    | 1409000 | 1409000 |
|                         | 45 | 9325                       | 9325    | 9325    |
|                         | 55 | 4113                       | 4113    | 4113    |
|                         | 65 | 1567                       | 1567    | 1567    |
|                         | 75 | 43                         | 43      | 43      |
|                         | 85 | 0                          | 0       | 0       |

This test was conducted using photometry techniques according to standard IES procedures. The user must therefore use caution in the following situations: 1) This test was performed using a specific ballast/lamp combination. Extrapolation of this data for other ballast/lamp combinations may produce erroneous results. 2) This test was conducted in a controlled laboratory environment where the ambient temperature was held at 25°C ±1°C. Field performance may differ particularly in regards to change in luminous output as a result of difference in ambient temperature and method of mounting the luminaire.



Zonal Lumen Tabulation (5 degree zones)

| Zone (Degrees) | Lumens | Zone (Degrees) | Lumens | Zone (Degrees) | Lumens | Zone (Degrees) | Lumens |
|----------------|--------|----------------|--------|----------------|--------|----------------|--------|
| 0-5            | 118.4  | 45-50          | 8.2    | 90-95          | 0      | 135-140        | 0      |
| 5-10           | 273.2  | 50-55          | 5.2    | 95-100         | 0      | 140-145        | 0      |
| 10-15          | 291.7  | 55-60          | 3.1    | 100-105        | 0      | 145-150        | 0      |
| 15-20          | 220.3  | 60-65          | 1.8    | 105-110        | 0      | 150-155        | 0      |
| 20-25          | 126.6  | 65-70          | 0.9    | 110-115        | 0      | 155-160        | 0      |
| 25-30          | 55.8   | 70-75          | 0.2    | 115-120        | 0      | 160-165        | 0      |
| 30-35          | 24.0   | 75-80          | 0.0    | 120-125        | 0      | 165-170        | 0      |
| 35-40          | 15.4   | 80-85          | 0      | 125-130        | 0      | 170-175        | 0      |
| 40-45          | 11.4   | 85-90          | 0      | 130-135        | 0      | 175-180        | 0      |

Polar Plot (Candela)

