



LUMINAIRE TESTING LABORATORY, INC.

SUSTAINING
MEMBER
of the
IESNA

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LTL NUMBER: 18361
 PREPARED FOR: LUMETTA, INC.
 CATALOG NUMBER: FW1800
 LUMINAIRE: FORMED WHITE ENAMEL STEEL HOUSING/REFLECTOR, TRANSLUCENT WHITE PLASTIC DIFFUSER WITH FORMED STEEL FRAME, OPEN TOP AND BOTTOM.
 LAMP: TWO VBD 26 WATT DOUBLE TUBE COMPACT FLUORESCENT LAMPS RATED AT 1800 LUMENS EACH.
 LAMP CATALOG NUMBER: SYLVANIA CF26DD/E/841
 BALLAST: ONE SAGE LIGHTING MODEL: NAU232
 MOUNTING: WALL
 ELECTRICAL VALUES: 120.0VAC, 0.4280A, 51.30W

DATE: 04-08-2010

Candela Distribution

| | 0 | 22.5 | 45 | 67.5 | 90 | 112.5 | 135 | 157.5 | 180 | 202.5 | 225 | 247.5 | 270 | 292.5 | 315 | 337.5 | Flux |
|-----|-----|------|-----|------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-------|
| 0 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | |
| 5 | 58 | 60 | 51 | 37 | 26 | 32 | 42 | 50 | 56 | 50 | 42 | 32 | 26 | 37 | 51 | 60 | 6.4 |
| 15 | 252 | 251 | 218 | 172 | 122 | 139 | 147 | 186 | 210 | 186 | 147 | 139 | 122 | 172 | 218 | 251 | 52.7 |
| 25 | 264 | 284 | 310 | 317 | 226 | 185 | 225 | 255 | 258 | 255 | 225 | 185 | 226 | 317 | 310 | 284 | 118.3 |
| 35 | 234 | 237 | 259 | 356 | 284 | 196 | 225 | 226 | 212 | 226 | 225 | 196 | 284 | 356 | 259 | 237 | 155.8 |
| 45 | 220 | 214 | 205 | 259 | 241 | 180 | 179 | 158 | 144 | 158 | 179 | 180 | 241 | 259 | 205 | 214 | 156.0 |
| 55 | 220 | 210 | 182 | 161 | 174 | 141 | 121 | 92 | 86 | 92 | 121 | 141 | 174 | 161 | 182 | 210 | 138.6 |
| 65 | 224 | 211 | 176 | 127 | 114 | 93 | 67 | 54 | 53 | 54 | 67 | 93 | 114 | 127 | 176 | 211 | 121.7 |
| 75 | 223 | 209 | 168 | 111 | 69 | 53 | 38 | 31 | 33 | 31 | 38 | 53 | 69 | 111 | 168 | 209 | 107.0 |
| 85 | 219 | 204 | 161 | 97 | 43 | 29 | 21 | 16 | 19 | 16 | 21 | 29 | 43 | 97 | 161 | 204 | 94.5 |
| 90 | 219 | 203 | 159 | 94 | 36 | 22 | 14 | 9 | 13 | 9 | 14 | 22 | 36 | 94 | 159 | 203 | |
| 95 | 220 | 205 | 162 | 100 | 46 | 31 | 22 | 17 | 22 | 17 | 22 | 31 | 46 | 100 | 162 | 205 | 97.1 |
| 105 | 235 | 220 | 181 | 128 | 92 | 65 | 52 | 44 | 48 | 44 | 52 | 65 | 92 | 128 | 181 | 220 | 123.9 |
| 115 | 249 | 236 | 205 | 183 | 245 | 118 | 101 | 81 | 82 | 81 | 101 | 118 | 245 | 183 | 205 | 236 | 165.7 |
| 125 | 263 | 254 | 239 | 298 | 364 | 175 | 164 | 137 | 132 | 137 | 164 | 175 | 364 | 298 | 239 | 254 | 204.7 |
| 135 | 287 | 287 | 307 | 439 | 407 | 218 | 227 | 206 | 197 | 206 | 227 | 218 | 407 | 439 | 307 | 287 | 225.1 |
| 145 | 349 | 363 | 403 | 504 | 400 | 239 | 266 | 268 | 263 | 268 | 266 | 239 | 400 | 504 | 403 | 363 | 213.8 |
| 155 | 423 | 429 | 421 | 414 | 304 | 236 | 252 | 285 | 289 | 285 | 252 | 236 | 304 | 414 | 421 | 429 | 155.1 |
| 165 | 378 | 354 | 304 | 241 | 190 | 190 | 189 | 218 | 227 | 218 | 189 | 190 | 190 | 241 | 304 | 354 | 71.6 |
| 175 | 146 | 132 | 117 | 102 | 95 | 101 | 110 | 115 | 115 | 115 | 110 | 101 | 95 | 102 | 117 | 132 | 12.9 |
| 180 | 78 | 78 | 78 | 78 | 78 | 78 | 78 | 78 | 78 | 78 | 78 | 78 | 78 | 78 | 78 | 78 | |

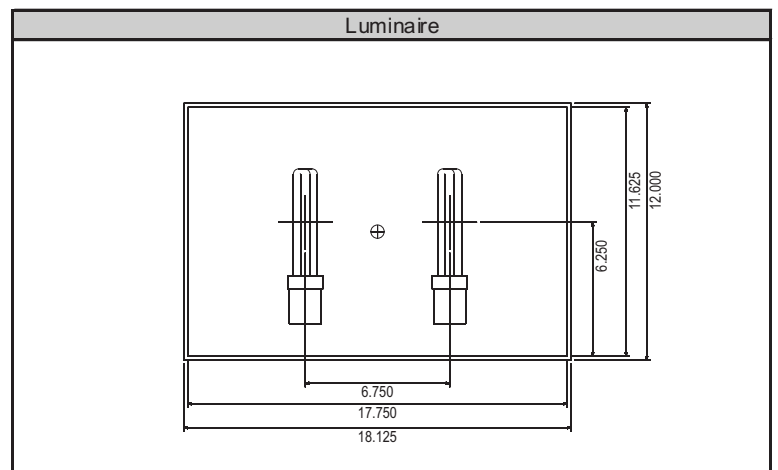
Zonal Lumen Summary

| Zone | Lumens | % of Lamp | % of Luminaire |
|--------|--------|-----------|----------------|
| 0-30 | 177.3 | 4.9% | 8.0% |
| 0-40 | 333.1 | 9.3% | 15.0% |
| 0-60 | 627.7 | 17.4% | 28.3% |
| 0-90 | 951.0 | 26.4% | 42.8% |
| 90-180 | 1270.0 | 35.3% | 57.2% |
| 0-180 | 2221.0 | 61.7% | 100.0% |

Total luminaire efficiency: 61.7%

CIE Type: Direct/Indirect
 Spacing Criterion: 0 deg: 6.34 90 deg: 4.71
 180 deg: 3.81 270 deg: 4.71

Total reflectance of paint: 79.1



Approved By: MG

*DATA WAS ACQUIRED USING THE CALIBRATED PHOTODETECTOR METHOD OF ABSOLUTE PHOTOMETRY. A UDT MODEL #211 PHOTODETECTOR AND UDT MODEL #S370 OPTOMETER COMBINATION WERE USED AS A STANDARD. A SPECTRAL MISMATCH CORRECTION FACTOR WAS EMPLOYED BASED ON THE SPECTRAL RESPONSIVITY OF THE PHOTODETECTOR AND THE SPECTRAL POWER DISTRIBUTION OF THE TEST SUBJECT.

TESTING WAS PERFORMED IN ACCORDANCE WITH IES LM-79-08.
 TEST ANGULAR INCREMENTS AND REPORT FORMATTING WAS BASED ON IES LM-41-98 AND LM-46-04.



Candela Tabulation (5 degree Vertical Increments)

| | | | | | | | | | | | | | | | | |
|-----|-----|------|-----|------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|
| | 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 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| 5 | 58 | 60 | 51 | 37 | 26 | 32 | 42 | 50 | 56 | 50 | 42 | 32 | 26 | 37 | 51 | 60 |
| 10 | 150 | 149 | 128 | 94 | 67 | 83 | 100 | 117 | 133 | 117 | 100 | 83 | 67 | 94 | 128 | 149 |
| 15 | 252 | 251 | 218 | 172 | 122 | 139 | 147 | 186 | 210 | 186 | 147 | 139 | 122 | 172 | 218 | 251 |
| 20 | 282 | 294 | 288 | 252 | 175 | 170 | 194 | 236 | 253 | 236 | 194 | 170 | 175 | 252 | 288 | 294 |
| 25 | 264 | 284 | 310 | 317 | 226 | 185 | 225 | 255 | 258 | 255 | 225 | 185 | 226 | 317 | 310 | 284 |
| 30 | 246 | 257 | 295 | 353 | 271 | 192 | 235 | 246 | 240 | 246 | 235 | 192 | 271 | 353 | 295 | 257 |
| 35 | 234 | 237 | 259 | 356 | 284 | 196 | 225 | 226 | 212 | 226 | 225 | 196 | 284 | 356 | 259 | 237 |
| 40 | 224 | 223 | 228 | 314 | 272 | 191 | 204 | 194 | 179 | 194 | 204 | 191 | 272 | 314 | 228 | 223 |
| 45 | 220 | 214 | 205 | 259 | 241 | 180 | 179 | 158 | 144 | 158 | 179 | 180 | 241 | 259 | 205 | 214 |
| 50 | 219 | 211 | 190 | 205 | 201 | 162 | 149 | 123 | 113 | 123 | 149 | 162 | 201 | 205 | 190 | 211 |
| 55 | 220 | 210 | 182 | 161 | 174 | 141 | 121 | 92 | 86 | 92 | 121 | 141 | 174 | 161 | 182 | 210 |
| 60 | 221 | 210 | 178 | 139 | 146 | 117 | 93 | 69 | 68 | 69 | 93 | 117 | 146 | 139 | 178 | 210 |
| 65 | 224 | 211 | 176 | 127 | 114 | 93 | 67 | 54 | 53 | 54 | 67 | 93 | 114 | 127 | 176 | 211 |
| 70 | 224 | 210 | 172 | 118 | 87 | 72 | 50 | 40 | 42 | 40 | 50 | 72 | 87 | 118 | 172 | 210 |
| 75 | 223 | 209 | 168 | 111 | 69 | 53 | 38 | 31 | 33 | 31 | 38 | 53 | 69 | 111 | 168 | 209 |
| 80 | 222 | 207 | 165 | 104 | 54 | 39 | 29 | 23 | 26 | 23 | 29 | 39 | 54 | 104 | 165 | 207 |
| 85 | 219 | 204 | 161 | 97 | 43 | 29 | 21 | 16 | 19 | 16 | 21 | 29 | 43 | 97 | 161 | 204 |
| 90 | 219 | 203 | 159 | 94 | 36 | 22 | 14 | 9 | 13 | 9 | 14 | 22 | 36 | 94 | 159 | 203 |
| 95 | 220 | 205 | 162 | 100 | 46 | 31 | 22 | 17 | 22 | 17 | 22 | 31 | 46 | 100 | 162 | 205 |
| 100 | 227 | 213 | 171 | 113 | 66 | 46 | 36 | 30 | 34 | 30 | 36 | 46 | 66 | 113 | 171 | 213 |
| 105 | 235 | 220 | 181 | 128 | 92 | 65 | 52 | 44 | 48 | 44 | 52 | 65 | 92 | 128 | 181 | 220 |
| 110 | 242 | 228 | 193 | 150 | 163 | 91 | 74 | 61 | 64 | 61 | 74 | 91 | 163 | 150 | 193 | 228 |
| 115 | 249 | 236 | 205 | 183 | 245 | 118 | 101 | 81 | 82 | 81 | 101 | 118 | 245 | 183 | 205 | 236 |
| 120 | 257 | 245 | 220 | 231 | 315 | 148 | 133 | 106 | 104 | 106 | 133 | 148 | 315 | 231 | 220 | 245 |
| 125 | 263 | 254 | 239 | 298 | 364 | 175 | 164 | 137 | 132 | 137 | 164 | 175 | 364 | 298 | 239 | 254 |
| 130 | 274 | 267 | 268 | 373 | 394 | 199 | 197 | 170 | 164 | 170 | 197 | 199 | 394 | 373 | 268 | 267 |
| 135 | 287 | 287 | 307 | 439 | 407 | 218 | 227 | 206 | 197 | 206 | 227 | 218 | 407 | 439 | 307 | 287 |
| 140 | 313 | 320 | 358 | 489 | 412 | 231 | 251 | 240 | 232 | 240 | 251 | 231 | 412 | 489 | 358 | 320 |
| 145 | 349 | 363 | 403 | 504 | 400 | 239 | 266 | 268 | 263 | 268 | 266 | 239 | 400 | 504 | 403 | 363 |
| 150 | 392 | 406 | 427 | 477 | 359 | 240 | 267 | 284 | 284 | 284 | 267 | 240 | 359 | 477 | 427 | 406 |
| 155 | 423 | 429 | 421 | 414 | 304 | 236 | 252 | 285 | 289 | 285 | 252 | 236 | 304 | 414 | 421 | 429 |
| 160 | 425 | 416 | 382 | 330 | 247 | 221 | 224 | 261 | 271 | 261 | 224 | 221 | 247 | 330 | 382 | 416 |
| 165 | 378 | 354 | 304 | 241 | 190 | 190 | 189 | 218 | 227 | 218 | 189 | 190 | 190 | 241 | 304 | 354 |
| 170 | 269 | 244 | 205 | 161 | 138 | 144 | 152 | 164 | 167 | 164 | 152 | 144 | 138 | 161 | 205 | 244 |
| 175 | 146 | 132 | 117 | 102 | 95 | 101 | 110 | 115 | 115 | 115 | 110 | 101 | 95 | 102 | 117 | 132 |
| 180 | 78 | 78 | 78 | 78 | 78 | 78 | 78 | 78 | 78 | 78 | 78 | 78 | 78 | 78 | 78 | 78 |

Zonal Lumen Tabulation (5 degree zones)

| Zone | Lumens | Zone | Lumens | Zone | Lumens | Zone | Lumens |
|-------|--------|-------|--------|---------|--------|---------|--------|
| 0-5 | 0.7 | 45-50 | 76.2 | 90-95 | 45.9 | 135-140 | 113.6 |
| 5-10 | 5.7 | 50-55 | 71.5 | 95-100 | 51.2 | 140-145 | 111.3 |
| 10-15 | 17.7 | 55-60 | 67.1 | 100-105 | 57.7 | 145-150 | 102.5 |
| 15-20 | 35.0 | 60-65 | 62.8 | 105-110 | 66.2 | 150-155 | 87.3 |
| 20-25 | 52.2 | 65-70 | 58.9 | 110-115 | 77.3 | 155-160 | 67.7 |
| 25-30 | 66.0 | 70-75 | 55.2 | 115-120 | 88.4 | 160-165 | 46.0 |
| 30-35 | 75.8 | 75-80 | 51.8 | 120-125 | 98.3 | 165-170 | 25.6 |
| 35-40 | 80.0 | 80-85 | 48.7 | 125-130 | 106.4 | 170-175 | 10.6 |
| 40-45 | 79.8 | 85-90 | 45.8 | 130-135 | 111.5 | 175-180 | 2.3 |



| Coefficients of Utilization - 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) | | | | | | | | | | | | |
| 0 | 0.709 | 0.709 | 0.709 | 0.709 | 0.65 | 0.65 | 0.65 | 0.65 | 0.594 | 0.594 | 0.594 | 0.594 |
| 1 | 0.638 | 0.601 | 0.569 | 0.54 | 0.582 | 0.551 | 0.522 | 0.497 | 0.529 | 0.502 | 0.478 | 0.456 |
| 2 | 0.577 | 0.518 | 0.47 | 0.43 | 0.525 | 0.475 | 0.433 | 0.397 | 0.476 | 0.433 | 0.396 | 0.365 |
| 3 | 0.524 | 0.451 | 0.395 | 0.351 | 0.477 | 0.413 | 0.364 | 0.326 | 0.432 | 0.377 | 0.334 | 0.3 |
| 4 | 0.478 | 0.396 | 0.337 | 0.293 | 0.434 | 0.363 | 0.311 | 0.271 | 0.393 | 0.331 | 0.286 | 0.251 |
| 5 | 0.437 | 0.35 | 0.29 | 0.247 | 0.397 | 0.321 | 0.268 | 0.229 | 0.359 | 0.293 | 0.247 | 0.212 |
| 6 | 0.401 | 0.311 | 0.253 | 0.211 | 0.364 | 0.286 | 0.234 | 0.196 | 0.329 | 0.262 | 0.215 | 0.182 |
| 7 | 0.369 | 0.279 | 0.222 | 0.183 | 0.335 | 0.257 | 0.206 | 0.17 | 0.304 | 0.235 | 0.19 | 0.157 |
| 8 | 0.341 | 0.251 | 0.196 | 0.159 | 0.31 | 0.231 | 0.182 | 0.148 | 0.281 | 0.212 | 0.168 | 0.137 |
| 9 | 0.316 | 0.228 | 0.175 | 0.14 | 0.288 | 0.21 | 0.162 | 0.13 | 0.261 | 0.193 | 0.15 | 0.121 |
| 10 | 0.294 | 0.207 | 0.157 | 0.123 | 0.268 | 0.191 | 0.146 | 0.115 | 0.243 | 0.176 | 0.135 | 0.107 |

| Ceiling Cavity Reflectance | 50 | | | | 30 | | | 10 | | | 0 |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Wall Reflectance | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 0 |
| Room Cavity Ratio (RCR) | | | | | | | | | | | |
| 0 | 0.489 | 0.489 | 0.489 | 0.489 | 0.394 | 0.394 | 0.394 | 0.306 | 0.306 | 0.306 | 0.264 |
| 1 | 0.431 | 0.412 | 0.394 | 0.378 | 0.328 | 0.316 | 0.304 | 0.252 | 0.243 | 0.235 | 0.199 |
| 2 | 0.386 | 0.354 | 0.327 | 0.304 | 0.282 | 0.263 | 0.246 | 0.215 | 0.202 | 0.19 | 0.158 |
| 3 | 0.349 | 0.309 | 0.277 | 0.251 | 0.246 | 0.222 | 0.203 | 0.187 | 0.171 | 0.157 | 0.129 |
| 4 | 0.317 | 0.272 | 0.237 | 0.21 | 0.217 | 0.191 | 0.17 | 0.165 | 0.147 | 0.132 | 0.107 |
| 5 | 0.29 | 0.241 | 0.205 | 0.178 | 0.192 | 0.166 | 0.145 | 0.147 | 0.128 | 0.112 | 0.091 |
| 6 | 0.266 | 0.216 | 0.18 | 0.153 | 0.172 | 0.145 | 0.125 | 0.132 | 0.112 | 0.097 | 0.078 |
| 7 | 0.246 | 0.194 | 0.158 | 0.133 | 0.155 | 0.128 | 0.108 | 0.119 | 0.099 | 0.084 | 0.067 |
| 8 | 0.228 | 0.176 | 0.141 | 0.116 | 0.141 | 0.114 | 0.095 | 0.109 | 0.089 | 0.074 | 0.059 |
| 9 | 0.212 | 0.16 | 0.126 | 0.102 | 0.129 | 0.103 | 0.084 | 0.099 | 0.08 | 0.066 | 0.052 |
| 10 | 0.198 | 0.146 | 0.113 | 0.091 | 0.118 | 0.092 | 0.074 | 0.091 | 0.072 | 0.058 | 0.046 |

Average Luminance Table (cd/m²)

| | 0 | 45 | 90 |
|----|------|------|------|
| 0 | 233 | 233 | 233 |
| 45 | 1611 | 1644 | 3931 |
| 55 | 1516 | 1384 | 2977 |
| 65 | 1500 | 1306 | 2124 |
| 75 | 1502 | 1267 | 1451 |
| 85 | 1526 | 1261 | 1105 |

Note: The zonal cavity calculation technique is accurate when luminaires with symmetric candela distributions are employed and when the luminaires are located symmetrically throughout the room. This unit has special characteristics and therefore these values should be used with caution.

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 THESE 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.

