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LTL NUMBER: 07933
PREPARED FOR: SIM-KAR LIGHTING
CATALOG NUMBER: ADJUST-454

DATE: 02-13-2004

LUMINAIRE: FORMED STEEL HOUSING WITH CAST ALUMINUM ENDS, FORMED SPECULAR ALUMINUM REFLECTORS, NO ENCLOSURE. LAMPS IN LOW POSITION.

LAMPS: SIX 54 WATT HIGH OUTPUT T5 LINEAR FLUORESCENT LAMPS RATED AT 4400 LUMENS EACH.

LAMP CATALOG NUMBER: SYLVANIA FP54/830/HO

BALLASTS: TWO WORKHORSE WH7-120-L

LER: 90.2 BASED ON A MEASURED BALLAST FACTOR OF 116.0%

NOTE: THIS TEST WAS PRORATED FROM LTL TEST NUMBER 07930 TO SIMULATE A FOUR LAMP T5 LINEAR FLUORESCENT LUMINAIRE.

MOUNTING: PENDENT

LUMEN TO CANDELA RATIO USED = 9.18

TOTAL AS TESTED INPUT WATTS = 337.3 AT 120.0 VOLTS

TOTAL PRORATED INPUT WATTS = 224.9 AT 120.0 VOLTS

THE 0 DEGREE PLANE IS PARALLEL WITH THE LAMPS.

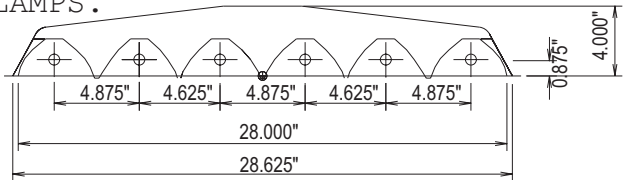
#07933

CANDELA DISTRIBUTION

Table with 6 columns: Candela values at 0.0, 22.5, 45.0, 67.5, 90.0 degrees for various angles from 0 to 90 degrees.

FLUX

Table with 2 columns: Flux values corresponding to the candela distribution table.



ZONAL LUMEN SUMMARY

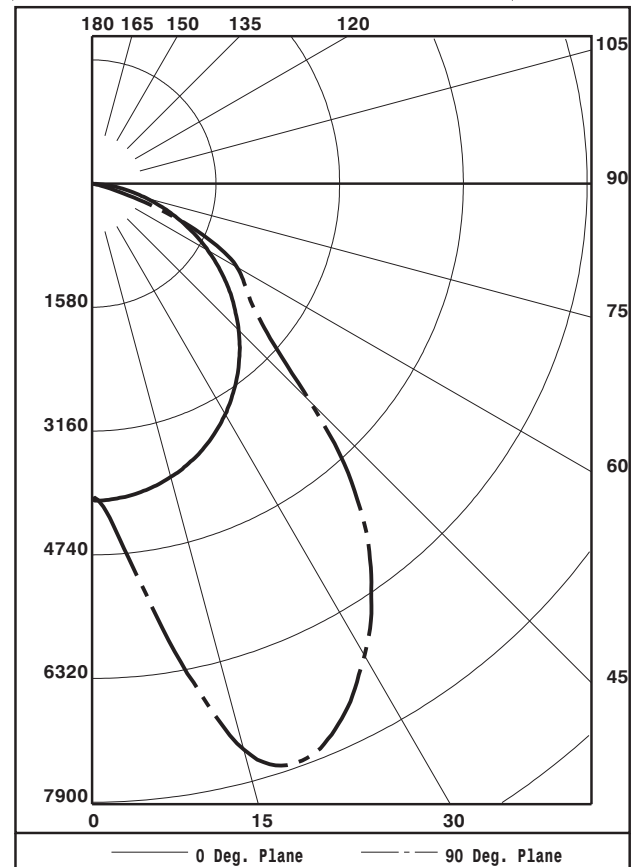
Table with 5 columns: Zone, Lumens, %LAMP, %FIXT for various angle zones.

TOTAL LUMINAIRE EFFICIENCY: 99.4%

CIE TYPE: DIRECT
PLANE: 0-DEG 90-DEG
SPACING CRITERIA: 1.3 1.8
LUMINOUS LENGTH: 48.125 28.625

LUMINANCE IN CANDELA PER SQUARE METER

Table with 4 columns: Average luminance at 0, 45, 55, 65, 75, 85 degrees for 0, 45, 90 degree planes.



TESTED BY HERSCHEL SCHRECK
CHECKED BY MIKE GRATHER



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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD
EFFECTIVE FLOOR CAVITY REFLECTANCE 0.20

Table with columns RC, RW, and rows for cavity heights 80, 70, 50, 30, 10, 0. Each row contains 18 numerical values representing utilization coefficients.

CANDELA DISTRIBUTION

Table with 6 columns representing beam angles from 0.0 to 90.0 and 18 rows representing height intervals from 0 to 90.

ZONAL LUMEN SUMMARY

Table with 3 columns representing height intervals (e.g., 0-5, 5-10) and 18 rows representing height intervals from 0 to 90, showing cumulative lumen values.

THIS TEST WAS CONDUCTED USING RELATIVE PHOTOMETRY TECHNIQUES ACCORDING TO STANDARD IESNA 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) ACCORDING TO IESNA PROCEDURES, THE BALLAST(S) AND LAMP(S) ARE PRESUMED TO PRODUCE 100% OF RATED OUTPUT. AN APPROPRIATE BALLAST FACTOR MUST BE APPLIED TO THE LUMEN OUTPUT RATINGS AND LUMINOUS INTENSITY VALUES GIVEN. 3) 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.



A Notice About Extremely High Efficiencies and Efficiencies Exceeding 100%

Preface

All fluorescent lamps exhibit some change in lumen output as a function of ambient temperature. This change in lumen output is a non-linear function that has a peak output temperature located near the middle of the lamp's usable temperature range. See Figure 1 for the temperature response of a typical T5 lamp. The specific temperature where the peak lumen output occurs is dependent on many variables within the lamp manufacturing process.

In the case of T5 lamps, the peak lumen output temperature falls near the 35°C(95°F) temperature.

What does this have to do with testing?

You might be wondering, "Since IESNA standards on fluorescent testing are based on relative photometry, what effect does this have on my photometric test?" Although the relative photometry method of testing luminaires is designed to normalize as many variables as possible, the efficiency that is calculated from the results of a relative photometric test is not a pure "optical efficiency". Consider the following:

- When the "bare lamps" are tested, they are tested in the ambient atmosphere of the lab 25°C(77°F).
- When the luminaire is tested, it is tested in the ambient atmosphere of the lab 25°C(77°F). The ambient temperature within the luminaire is guaranteed to be warmer than 25°C(77°F).

As it was stated earlier, the lumen output of the lamps will vary as a function of the ambient temperature. This means that the lumen output of the lamps when operated inside of the luminaire will be different from the lumen output of the lamps when they are tested for bare lamp output. The efficiency that is reported on a photometric test report is the ratio of the total luminous output of the luminaire to the total luminous output of the bare lamps. The only way that a test report can show the true "optical efficiency" of a luminaire is if the lamps produce the same amount of lumens in the luminaire as they did in the bare lamp test.

The point of this notice

Because the lumen output of the lamps operating within the luminaire can be different from the lumen output of the lamps operating outside of the luminaire, the luminaire efficiency can be increased/decreased beyond the "optical efficiency" of the luminaire. This situation occurs mostly in one or two lamp pendant T5 luminaires where mutual heating of the lamps, reflected radiant heat, contained heat, etc. can bring the temperature of the lamp close to the temperature that the lamp would operate at if it were in a 35°C(95°F) ambient temperature. Since T5 lamps have a peak lumen output near 35°C(95°F) ambient temperature, there is a possibility that an already high efficiency could be increased above 100%.

A Word of Caution

Although the efficiency shown in a relative photometric test report is not a pure "optical efficiency", this does not mean that there is a problem with the test procedure. It means that there is a temperature factor included into the test report based on an ambient temperature of 25°C(77°F). If you are using the test results in a situation where you know the ambient temperature will be significantly different from the 25°C(77°F) laboratory conditions, make sure that you use an appropriate temperature correction factor.

