Relative LUX Measurements of Refrigeration Cases Fitted with LED Illumination Systems

1.0 Purpose

The purpose of this document is to describe and present measured illumination test data collected between 27MAY10 and 2JUN10 by Robert S. Baker, Electrical Engineer for Advance Electronic Concepts (AEC), Portland, Maine.

2.0 Scope

The scope of this document is the series of illumination measurements.

3.0 Cases and Illumination Systems

The following is a list of luminaires measured:

1) AEC 4200° color temperature Case Lighting System in the factory test case.
2) Quanta 3500° color temperature Crossfire System in the Uxbridge, MA Hannaford store.
3) GE 3500° color temperature Case Lighting System in the Maine Mall, South Portland Hannaford store.
4) AEC 3500° color temperature Case Lighting System in the Riverside, Portland Hannaford Store.

4.0 Measurement Technique

All measurements were performed using a Mastech LX1330B light meter. The sensing head was mounted in a custom frame allowing it to be consistently, and in a repeatable fashion, mounted to the glass of a typical refrigeration case door. Two suction cups were used to temporarily mount the frame to the glass. A 24 inch square, plain white target was placed in each case against the front of the product shelves approximately 2/3 the way up the door.

Four measurements were performed and are described as follows:

1) Sensor positioned in the center of the door glass, 2/3 of the way up.
2) Sensor positioned on the left edge of the door glass, 2/3 of the way up.
3) Sensor positioned on the right edge of the door glass, 2/3 of the way up.
4) Sensor positioned in the center of the door glass, at the bottom.

The following measurement protocol was used:

1) Position the target against the product shelves so that it will completely fill the aperture of the sensor.
2) Mount the sensor to the door glass in the desired position.
3) Allow the anti-sweat heaters time to clear the glass.
4) Measure the illumination level in LUX with the luminaires on.
5) Measure the illumination level in LUX with the luminaires off.
6) Calculate the difference between the two measurements.
7) Record the data.

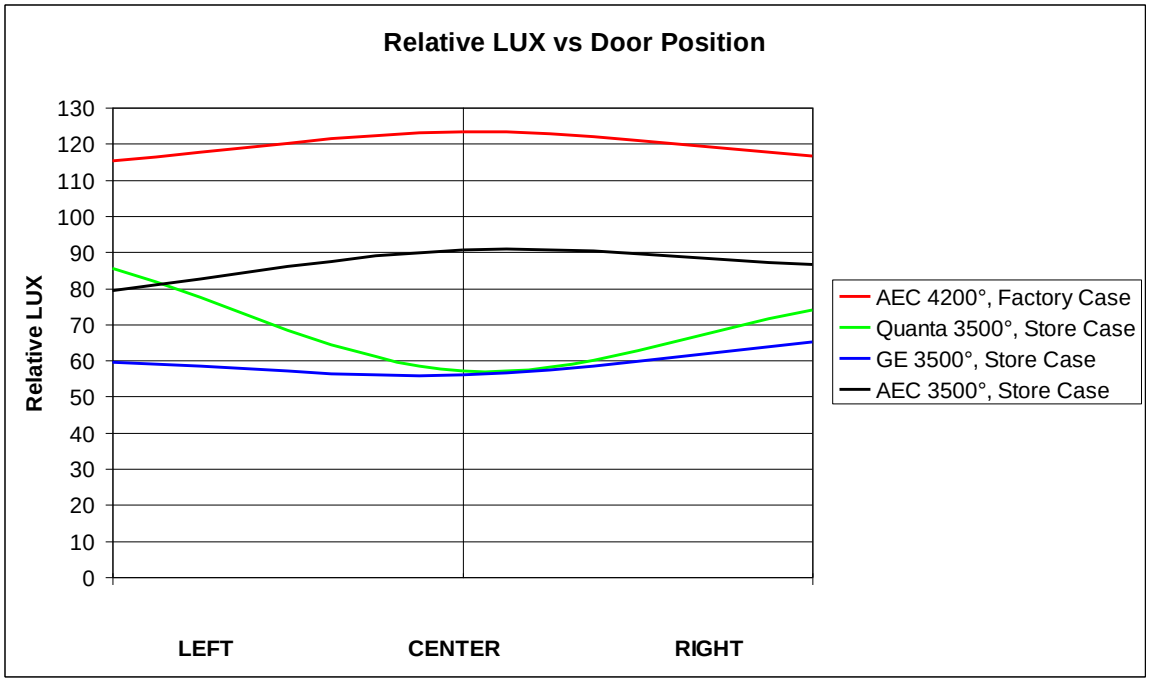
5.0 Measured Data

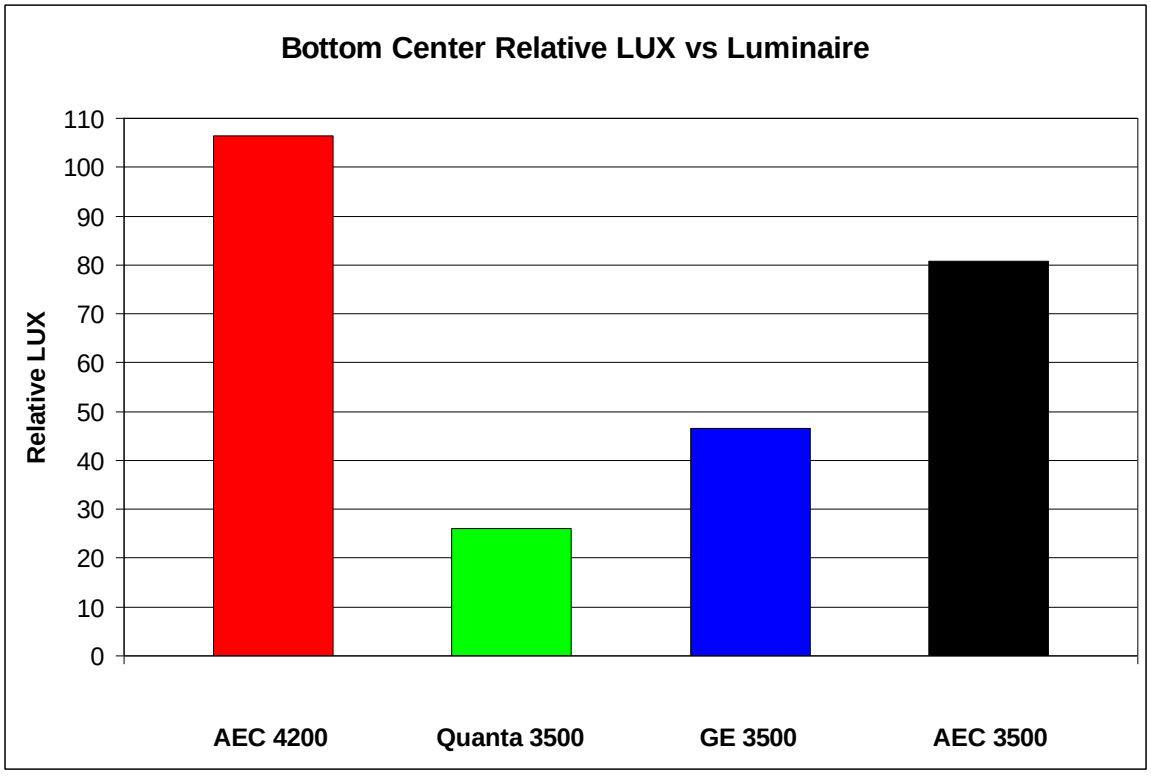
The following data was collected:

Measured Luminaire Performance	**AEC 4200° color temperature Case Lighting System in the factory test case**	**Quanta 3500° color temperature Crossfire System in the Uxbridge, MA Hannaford store**	**GE 3500° color temperature Case Lighting System in the Maine Mall, South Portland Hannaford store**	**AEC 3500° color temperature Case Lighting System in the Riverside, Portland Hannaford Store**
Fixture to Target (in)	6.0	5.0	6.0	6.0
∆ Center (LUX)	123.3	57.2	56.0	90.7
∆ Left (LUX)	115.2	85.6	59.5	79.3
∆ Right (LUX)	116.6	74.0	65.2	86.6
∆ Bottom Center (LUX)	106.4	26.0	46.5	80.7

6.0 Results

The following is the results in graphical format:





7.0 Conclusions

Each graph clearly shows that both of the AEC luminaires outperform the other brands in overall illumination and homogeneity of light distribution.