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Measurement of photoluminescence according to DIN 67510-1:2009 (2 appendices)

Identification

Object	One photoluminescent sign, Aluminium, 150x300 mm. See also picture in appendix 1.
Object state	Upon arrival the object had no visual damages.
Arrival date	Apr 29, 2011
Location	Borås
Measurement date	May 10, 2011

Measurement methods and procedures

The sample was exposed during a time of 5 minutes at 1000 lux from a 150 W xenon lamp filtered to D65. The illuminance at the measuring plane was measured with a luxmeter, Hagner, Model S2. After 5 minutes the xenon lamp was turned off and a luminance meter, Hagner ERP-105, connected to a PC-computer, was recording the luminance every minute during two hours. The measuring aperture corresponds to a measuring spot of about Ø 45 mm. The measuring position is shown in appendix 1. The sample was kept under dark conditions for at least 48 h prior to excitation.

To determine the colour during excitation and attenuation, a spectrophotometer, Photo Research PR-705, was used. The excitation was done with the light source D65 at 1000 lux for 5 minutes and the attenuation colour measurement started about 15 seconds after the lamp was switched off.

In accordance with section 4.5 in DIN 67510-1, a logarithmic extrapolation of the results was made in order to determine the time when the luminance is $0,3 \text{ mcd/m}^2$, the decay time.

Measurement conditions

Room temperature	$(23 \pm 2) \text{ }^\circ\text{C}$
Relative humidity	$(45 \pm 5) \%$
Illumination	Perpendicular to the sample, CIE standard illuminant D65

Results

The results only refer to the object specified in this document.

Table 1: Compilation of the results for luminance and decay time.

Sample ID	Luminance (mcd/m ²)					Decay time (min)
	2 min	10 min	30 min	60 min	120 min	
Sign, 150x300 mm	3667	712	202	87,7	36,9	7780

Table 2: CIE 1931 chromaticity coordinates for 2° standard observer. The colour denominations is according to Fig. 1 in DIN 67510-1:2001 (excitation – attenuation).

Sample ID	During excitation		During attenuation		Colour denomination
	x	y	x	y	
Sign, 150x300 mm	0,352	0,414	0,279	0,585	EW-K

Measuring uncertainty

The measuring uncertainty is $\pm 5\%$ of the measured luminance values and $\pm 0,005$ of the given values for x and y.

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k = 2$, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty has been determined in accordance with EA Publication EA-4/02 (formerly EAL-R2). The long term stability of the calibrated object is not included in the reported expanded uncertainty of measurement.

Equipment

Xenon-lamp with D65-filter, SP inv.no 502959
 Luminance meter ERP-105, SP inv.no 602931
 Multimeter Keithley 2000, SP inv.no. 602550
 Luxmeter Hagner S2, SP inv.no 500305
 Photometer Spectrascan PR-705, SP inv.no 503130

SP Technical Research Institute of Sweden Measurement Technology, MTK


 Mikael Lindgren
 Technical Manager

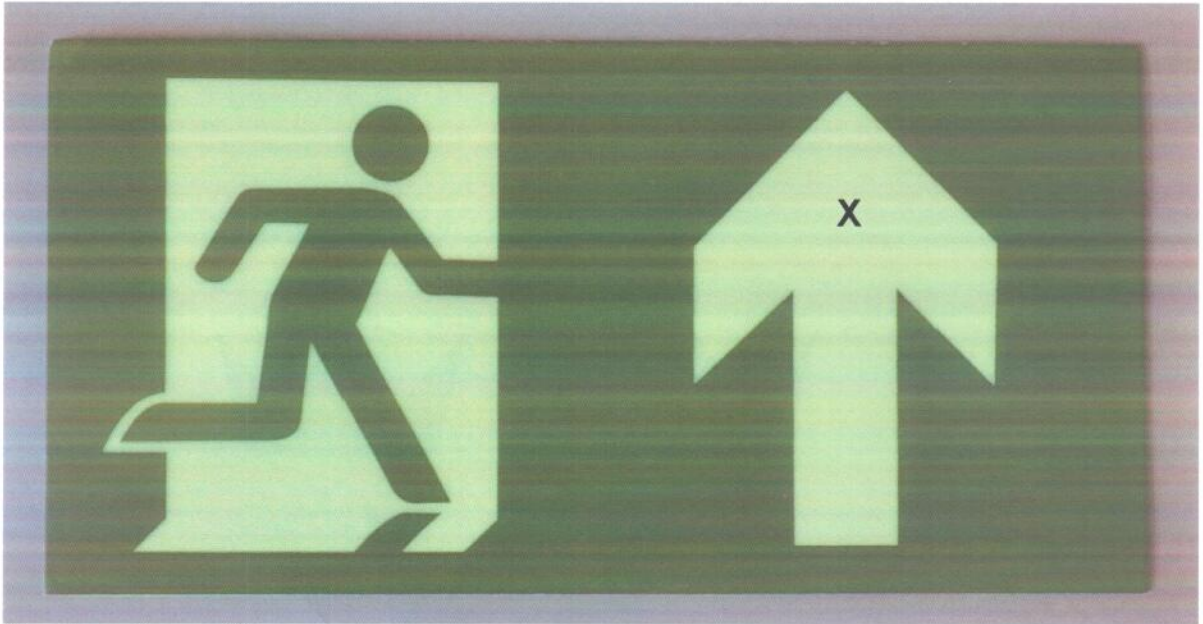

 Stefan Källberg
 Technical Officer

Appendices

Picture of photoluminescent sign
 Measured luminance, table and diagram

Appendix 1

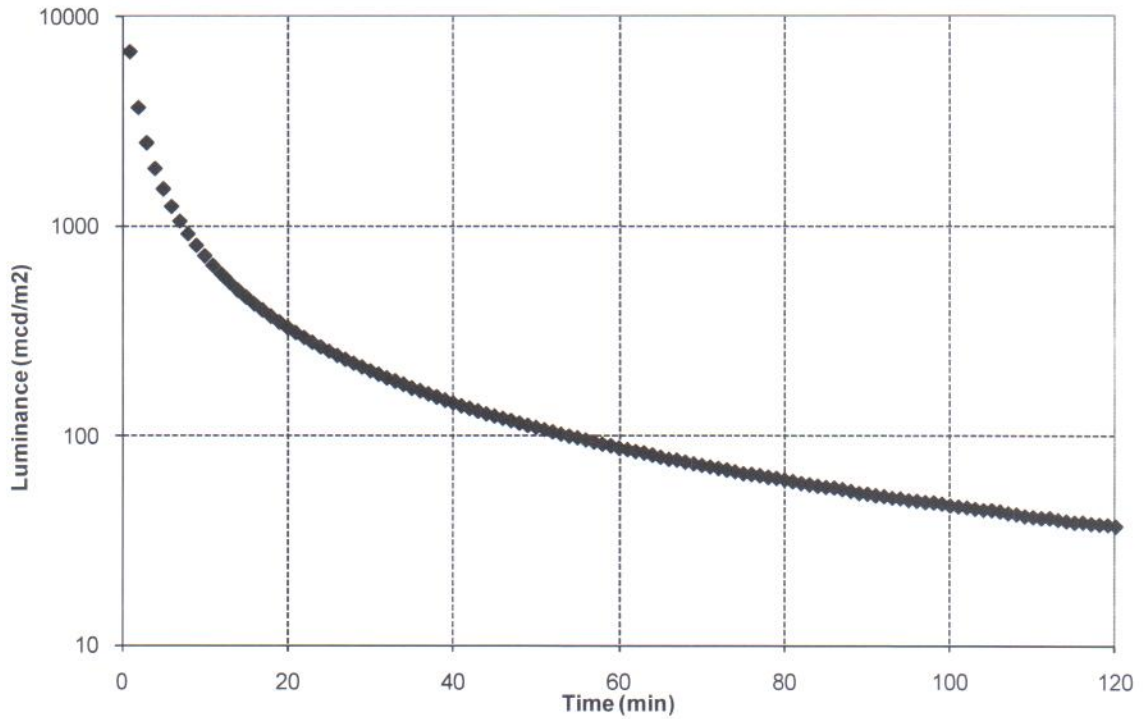
Picture of photoluminescent sign



X = measuring position

Appendix 2

Measured luminance after 5 minutes exposure at 1000 lux:



Time (min)	Measured luminance (mcd/m ²)	Time (min)	Measured luminance (mcd/m ²)
5	1491	65	79,2
10	712	70	72,4
15	453	75	66,1
20	326	80	61,8
25	251	85	57,0
30	202	90	52,9
35	168	95	49,3
40	143	100	46,4
45	124	105	44,1
50	110	110	40,9
55	98,1	115	38,4
60	87,7	120	36,9