

## Measurement of luminous flux

(1 appendix)

### Test objects

A rechargeable LED-headlamp have been characterized in terms of luminous flux and spectral parameters:

- LEDX Lights Snok 2000

### Identification

Date of arrival: March 7, 2022

Status of test objects: Without complaint

Customer reference: Anders Johansson

Manufacturer: LEDX of Sweden AB

### Date of measurement

March 14, 2022

### Measurement conditions

The measurement is performed in a temperature stabilized laboratory with the temperature  $+24\text{ °C} \pm 2\text{ °C}$ . The lamp is fully charged at the beginning of the measurement sequence conducted at the lamp's maximum flux level.

Instrumentation:

Reference lamp 11:5.

Detector and integrating sphere 1,5 m, inv.nr 500744.

Picoammeter Keithley 6485, inv.nr KWP02906.

Spectrometer QE65000, inv.nr 901736.

### RISE Research Institutes of Sweden AB

Postal address

Box 857  
501 15 BORÅS  
SWEDEN

Office location

Brinellgatan 4  
504 62 Borås  
SWEDEN

Phone / Fax / E-mail

+46 10-516 50 00  
+46 33-13 55 02  
info@ri.se

Confidentiality level

C2 - Internal

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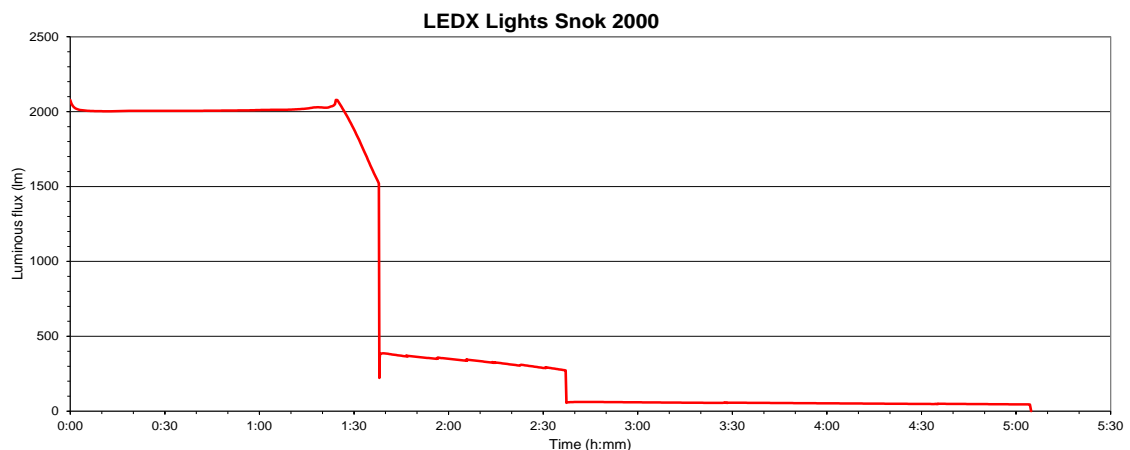
## Measurement method

Measurements are performed according to applicable parts of Method SP 5116. The lamp is mounted in the centre of an Ø1,5 m integrating sphere and the lamps optical axis is turned along the horizontal and vertical planes to obtain a mean flux value of 20 evenly spatially distributed flux measurements. The luminous flux is measured with a  $V(\lambda)$ -compensated silicon detector and the absorption of light in the lamps capsulation is corrected by the use of an auxiliary lamp.

## Measurement results

The relative luminous flux is recorded from the start-up time and an absolute measurement is performed when the temperature and flux level are stabilized, thus obtaining a start-up value of luminous flux. Spectral parameters are registered at the stabilized level.

Object	Maximal luminous flux (lm)	Colour Temp (K)	CRI (Ra)	Chromaticity	
				x	y
Snok 2000	2078	6046	69	0,3209	0,3351



## Measurement uncertainty

Luminous flux:  $\pm 5\%$

CCT:  $\pm 30$  K

CRI:  $\pm 0,4$  units

Chromaticity:  $\pm 0,0020$

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 of measurement has been determined in accordance with EAL Publication EA-04/2.

**Traceability**

The quantity luminous flux is realized through a group of luminous flux reference lamps that are traceable to MIKES/VTT, Finland. The used instruments are regularly calibrated with traceability to relevant national or international units or standards.

**Remark**

The result in this report is valid only for the tested object.

**RISE Research Institutes of Sweden AB  
Measurement Science and Technology - Time and Optics**

Performed by

Håkan Skoogh

**Appendix**

Photo of tested object

Appendix 1

Photo of tested object

