Philips Innovation Services
Optical Calibrations and Measurements
Spectroradiometry
Mathildelaan 1, 5611 BD Eindhoven

Tel: +31 40 27 55246 E-mail: h.stel@philips.com

Report nr	: hj10313
Date of report	: 17-jun-2013
Testfacility	: OCM VIS-IR
Operator	: J.Marinus
Responsible	: H.Stel
Meas type	: PhotoBiological

Photobiological safety evaluation report according to IEC 62471

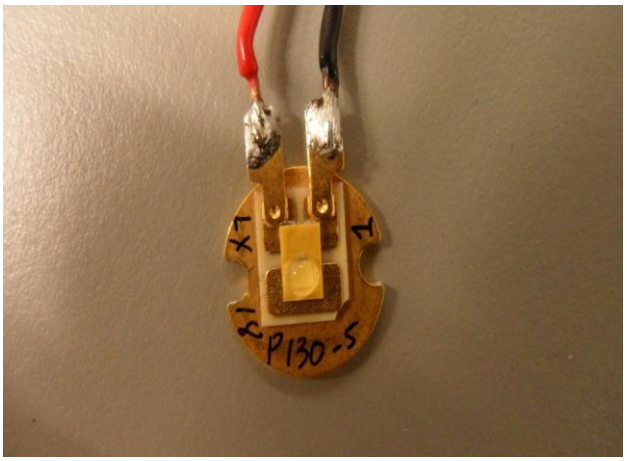
Customer	: Philips Lumileds Lighting Co LLC
Address	: 370 West Trimble Road San Jose, CA 95131, USA
Organisation	: Lumileds
Invoice Id	:

Measuring Conditions

Spectral Range [nm]	: 200-1800
Date Of Meas	: 14-5-2013 12:28
Burning position	: Horizontal
Meas.dist. Irradiance [mm]	: 200
Meas.dist. Radiance [mm]	: 200
Ambient temperature [°C]	: 25.5

Lamp Data

Lamp type	: LUXEON REBEL PLUS
Lamp nr	: LX18-P130-5
Life time	: 0
Gear	:
Description	: PHILIPS Lumileds Lighting Company BV
Reporting distance	: 200 mm (at 2230 lx)



Risk Categories Found (at reporting distance)

Hazards	
Actinic UV	: Exempt
Near UV	: Exempt
Retinal Blue SmallSrc	: Exempt
Retinal thermal	: Exempt
Retinal thermal WeakVis	: Exempt
InfraRed Eye	: Exempt
Thermal Skin	: pass

Remarks : LX18-P130 is part of the product family LUXEON Rebel PLUS. The sample measured, LX18-P130, is ANSI bin 3000K. The present classification is thus valid for all LUXEON Rebel PLUS from CCT bins equal or lower than 3000K as e.g. LX18-P127 (see TR IEC62778).

Signed by : H.Stel **Signature :**

(Head of Photobiological safety & Irradiance)

notes: RVA declaration of accreditation available at: http://www.rva.nl/uri/?uri=AMGATE_10218_1_TICH_R11753221190060

Philips Innovation Services
Optical Calibrations and Measurements
Spectroradiometry
Mathildelaan 1, 5611 BD Eindhoven
Tel: +31 40 27 55246 E-mail: h.stel@philips.com

Report nr	: hj10313
Date of report	: 17-jun-13
Testfacility	: EEA-622
Operator	: J.Marinus
Responsible	: H.Stel
Software Version	: 1.5.4.0

Photobiological safety evaluation report according to IEC 62471

Lamp Data

Lamp type	: LUXEON REBEL PLUS
Lamp nr	: LX18-P130-5
Life time [h]	: 0
Gear	:
Description	: PHILIPS Lumileds Lighting Company BV
	:
Source subtense α [rad]	: 0.0075
Appar.Src.Size [mm]	: 1.5
Reporting distance	: 200 mm (at 2230 lx)

Measuring Conditions

Spectral Range [nm]	: 200-1800
Date Of Meas	: 14-5-2013 12:28
Ambient temperature [°C]	: 25.5
Reference plane :	optical radiating center
Azimuth, Elevation [deg]	: ,
Meas.dist. Irradiance [mm]	: 200
Meas.dist. Radiance [mm]	: 200

Remarks

Measured electrical quantities

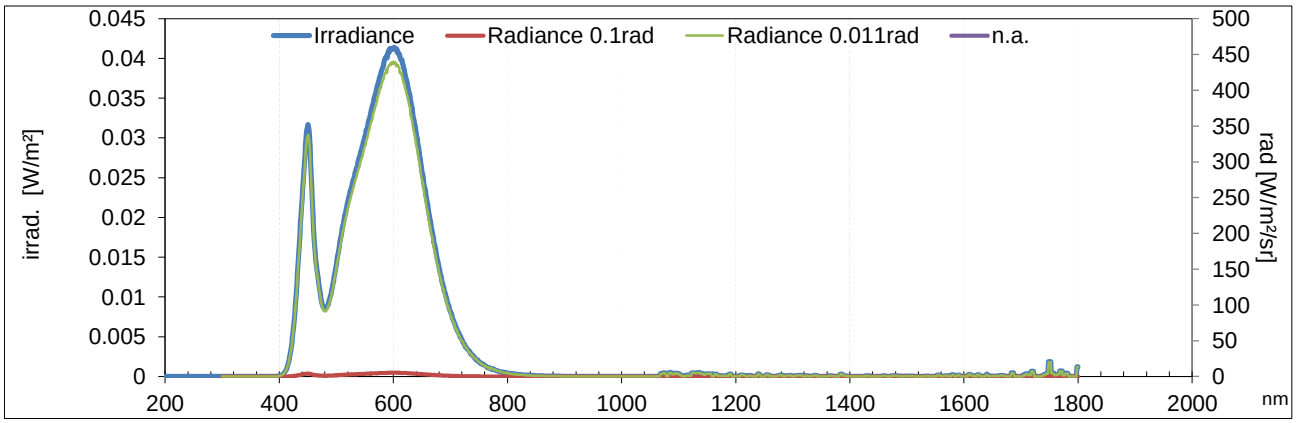
U lamp rms	: 3.087	V
I lamp rms	: 1.000	A
P lamp	: 3.090	W
	:	

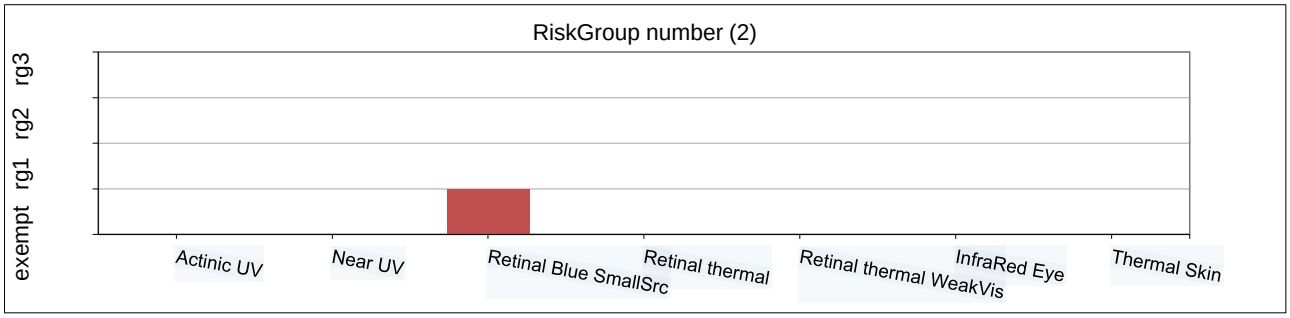
Calculated photometric quantities (1)

illuminance	: 2229.6	lx
Chromaticity x,y	: 0.407	0.382
Colour temperature	: 3379	K
Colour rendition avg8	: 83	

Hazards at viewing distance	Emission Level	Emission Limit for Rg2	Uncertainty Emission Level (k=2) [%]	Emission Level Unit	RiskGroup number (2)	RiskGroup	RG certainty [%] (4)	Emission Hazard Value (3)
Actinic UV	1.1954E-08	0.03	17.7	W/m²	0	Exempt	100	0.00
Near UV	0.00028876	100	4.16	W/m²	0	Exempt	100	0.00
Retinal Blue SmallSrc	0.9983	400	3.54	W/m²	0.99	Exempt	54	0.00
Retinal thermal	163420	9466700	6.59	W/m²/sr	0	Exempt	100	0.02
Retinal thermal WeakVis	2.907		7.55	W/m²/sr	0	Exempt	100	
InfraRed Eye	0.12984	3200	6.01	W/m²	0	Exempt	100	0.00
Thermal Skin	7.1993	3556.6	3.33	W/m²	0	pass	100	0.00

found:Exempt **verdict:passed**





notes :
(1) from irradiance spectrum, for information only
(2) logarithmic interpolated inter Riskgroup number
(3) ratio 'Emission Level' / 'Emission Limit'
(4) Probability the Riskgroup clasification is at most as indicated

Philips Innovation Services
Optical Calibrations and Measurements
Spectroradiometry
Mathildelaan 1, 5611 BD Eindhoven
Tel: +31 40 27 55246 E-mail: h.stel@philips.com

Report nr	: hj10313
Date of report	: 17-jun-yyyy
Testfacility	: OCM VIS-IR
Operator	: J.Marinus
Responsible	: H.H.Stel
Meas type	: PhotoBiological

Photobiological safety IEC 62471 results summary

Clause	Requirement + Test	Result - Remark	Verdict
Table 6.1	Emission limits for risk groups of continuous wave lamps		Pass

Risk	Action spectrum	Symbol	Units	Emission-Measurement					
				Exempt		Low-risk		Mod.risk	
				Result	Limit	Result	Limit	Result	Limit
Actinic UV	SUV(λ)	E_s	W/m²	11.95E-9	0.001		0.003		0.03
Near UV		E_{UVA}	W/m²	288.76E-6	10.0		33.0		100
Retinal Blue Light	B(λ)	L_B	W/m²/sr		100.0		10000		4000000
Retinal Blue SmallSrc*	B(λ)	E_B	W/m²	0.998	1.0*		1.0		400.0
Retinal thermal	R(λ)	L_R	W/m²/sr	163422	3733351		3733351		9466711
Retinal thermal WeakVis	R(λ)	L_{IR}	W/m²/sr	0	800004	246	800004		800004
InfraRed Eye		E_{IR}	W/m²	129.837E-3	100.0		570.0		3200
Thermal Skin		E_H	W/m²	7.2	35565.6				

* Small source defined as one with α < 0.011 radian. Averaging field of view at 10000 s is 0.1 radian
** Involves evaluation of non-GLS source.

Assumptions, anomalies and warnings

Possible product label text

Assumptions

Spatially uniform irradiance distribution (not a beam)

Continuous wave Lamp (not pulsed)

High Luminance of source (> 10000 cd/m2)

Anomalies (may cause unreliable results). Results are only for information if items are listed

Warnings

The products optimized for visible light emission as device under test use materials known and documented to emit if at all only negligibly in wavelength range 1800nm to 3000nm
The present Irradiance measurement range was therefore limited to 200nm to 1800nm

Terms and Conditions

This evaluation report has been executed in accordance with the measurements standards as provided in the international standard CEI IEC 62471:2006 and Technical report IEC/TR 62471-2.

Deviation from the methods that are described in the standard CEI IEC 62471 will be expressed clearly in this report

On request of the customer, the reported parameters that are not defined in the standard CEI IEC 62471, will be explained by the test laboratory

This evaluation report is applicable only to the product which is unambiguously identified in the report

If the product has no identification, the test laboratory will compute and report an unique identification for the specimen tested.

The customer is at all times responsible for the (technical) information, such as optical properties, provided by him

Reproduction of the complete report is allowed. Parts of the report may only be reproduced with written approval of the test laboratory.

The test laboratory shall not hand over measurement data and evaluation report to other parties than the customer unless there is written approval of the customer

This evaluation report is issued under the restriction that the test laboratory will not be held liable for any (direct and/or consequential) damage resulting directly or indirectly from the test activities

The Raad voor Accreditatie (RvA) is a member of the European Co-operation for Accreditation (EA) and is one of the signatories to the EA multilateral Agreement and to the ILAC Mutual Recognition Arrangements (MRA) for the mutual recognition of test reports

DUTCH ACCREDITATION COUNCIL RvA

PO Box 2768 NL-3500 GT Utrecht

The Dutch Accreditation Council RvA, by law appointed as the national accreditation body for The Netherlands, hereby declares that accreditation has been granted to:

Philips Lighting B.V.
Optical Calibrations and Measurements
Eindhoven

The organisation has demonstrated to be able to generate technical valid results in a competent way and work according to a management system.

This accreditation is based on an assessment against the requirements as laid down in ISO/IEC 17025:2005.

The accreditation covers the activities as specified in the authorized annex bearing the registration number.

The accreditation is valid provided that the organisation continues to meet the requirements.

The accreditation with registration number:

L 533

is granted on 29 August 2012

This declaration is valid until
1 September 2016

The accreditation has been granted for the first time on
29 August 2012

The Chief Executive

Ir. J.C. van der Poel

Annex to ISO/IEC 17025 declaration of accreditation
for registration number: **L 533**

RAAD VOOR ACCREDITATIE

of **Philips Lighting B.V.**
Optical Calibrations and Measurements
Eindhoven

This annex is valid from: **29-08-2012** to **01-09-2016** Replaces annex dated: **n.a.**

Premises: **Eindhoven**

No.	Material or product	Type of activity	Internal reference number
1	Lamps and lamp systems	Spectral, optical measurements in the wavelength range from 200 nm through 3000 nm for the evaluation of photo biological safety.	WI04 in accordance with CEI IEC 62471 and IEC/TR 62471-2[1]

IEC/TR 62471-2[1]: with the exception of pulsed lamps and lamps systems (par. 6.2)

This annex has been approved by:

Ir. J.C. van der Poel
Chief Executive