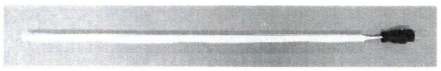
Test Report 012-19 -g194

OSRAM GmbH · Central Laboratory for Light Measurements (I LMA LMS) · Berliner Allee 65 · 86153 Augsburg

Subject	**Photometric Evaluation**
Object	**Luminaire**
Manufacturer	**VolgaProSvet**
Type	**VolgaProSvet T5 Horticulture**
Serial number	**g194**
Applicant	**VolgaProSvet GmbH** **Ulitsa Nikitina, 2** **400059, g. Volgograd** **Rossiya**
Represented by	**OSRAM Opto Semiconductors GmbH**
Customer Order No.	**PASS 69374**
Date of measurement	**25.01.2019**
Number of pages	**3**



Dimensions [mm]:
873 x 27 x 34

• Type of measurement

Determination of the electrical data, luminous intensity distribution, the luminous flux and the spectral power distribution by adjusting the nominal system voltage.

• Results of measurement

Measurand	value	uncertainty (k=2)
System voltage U_S [V] (given quantity)	230.0	2.3
System current I_S [A]	0.0612	0.0007
System power P_S [W]	13.05	0.14
Power factor λ	0.93	0.02
Luminous flux Φ [lm]	510	20
Luminous efficacy η_V [lm/W]	39.0	1.6

• Attached ascii data

Spectral power distribution* [W/nm]: 012-19-g194_VolgaProSvet T5 Horticulture.prn

Eulumdat (*.ldt/*.ies): 012-19-g194_VolgaProSvet T5 Horticulture - raw.ldt (*.ies)
012-19-g194_VolgaProSvet T5 Horticulture - sym.ldt (*.ies)

Date	Acting head of the laboratory	Person in charge
13.02.2019	N. Wagner	N. Leise

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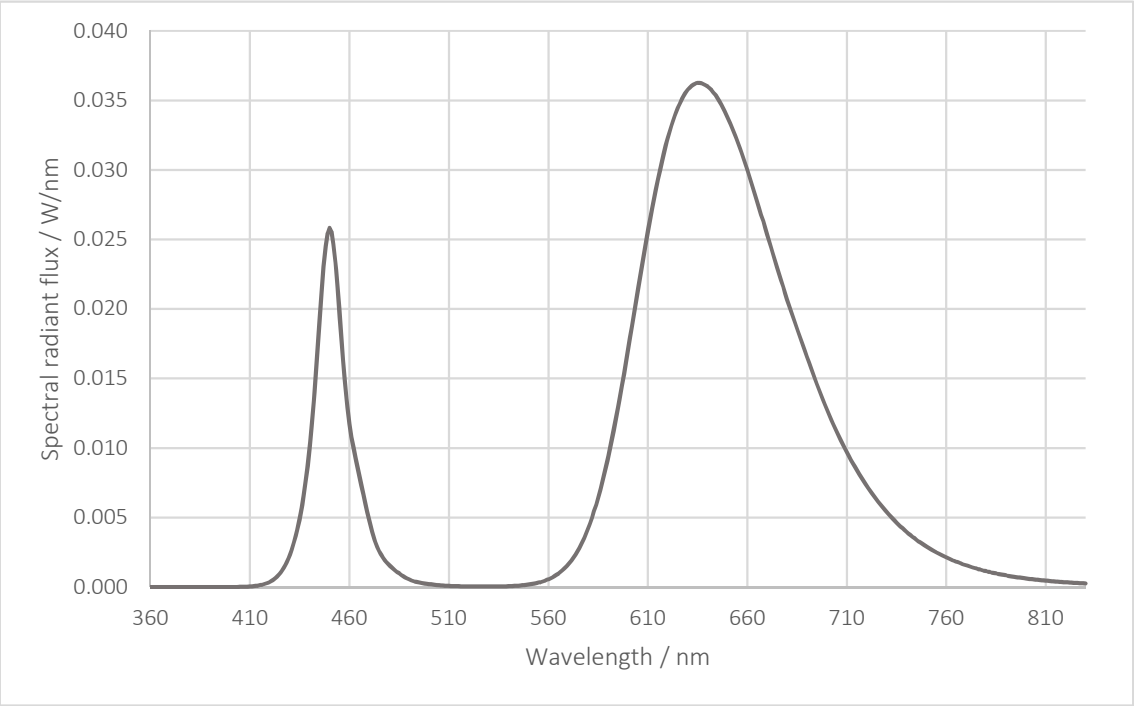
• Spectral power distribution*



• Colorimetric values

Measurand	value	uncertainty (k=2)
Color coordinate *x*	0.4894	0.0035
Color coordinate *y*	0.2261	0.0035
Correlated color temperature *CCT* [K]	-	-
Color distance *DC*	-	-

• Photosynthesis values

Measurand	value	uncertainty (k=2)
Radiant power $\Phi_{e,380\ldots780\ nm}$ [W]	3.93	0.10
Photosynthetic photon flux $PPF_{400\ldots700\ nm}$ [µmol/s]	18.1	0.5
Photosynthetic photon flux $PPF_{600\ldots750\ nm}$ [µmol/s]	16.8	0.5
Photosynthesis *sy1* [W] according to DIN 5031-10 (2018)	3.02	0.08
Photosynthesis *sy2* [W] according to DIN 5031-10 (2018)	3.06	0.08

*Values lower than detection limit were set to zero

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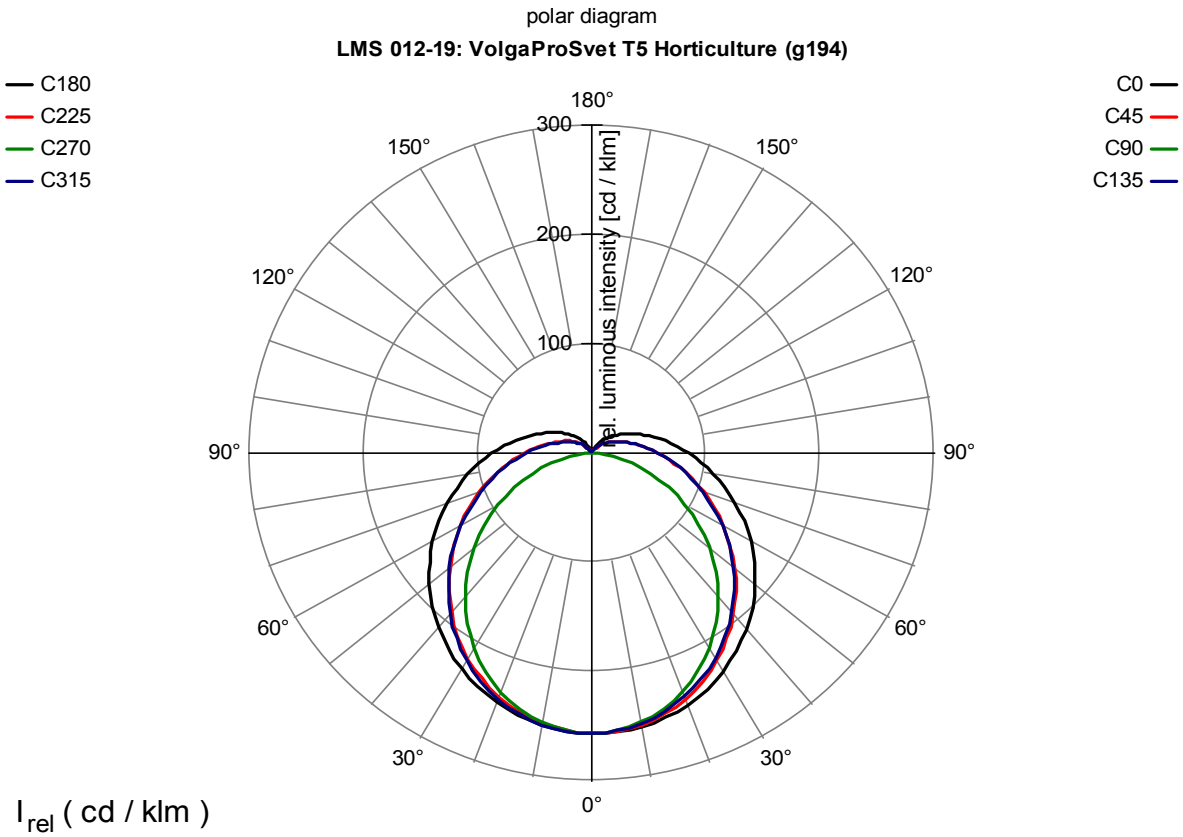
• Luminous intensity distribution



I_{rel} (cd / klm)

• Measurement conditions

Orientation of the object:	Horizontal, radiation downwards, power cord in C90
Power supply:	Alternating current at 50 Hz, voltage as adjusted quantity
System voltage:	Measurement at the end of the power cord
Time course:	Burning in up to photometric stability > 60 minutes at measurement conditions
Ambient temperature:	(25 ± 1) °C

• Equipment used

LMT GO-DS 2000
Integrating Sphere

• Measurement methods

CIE 84 – Technical Report: The measurement of luminous flux
CIE 15:2004 – Technical Report: Colorimetry
IES LM-79-08: Electrical and Photometric Measurements of Solid-State Lighting Product
DIN EN 13032-1:2004 (D): Licht und Beleuchtung – Messung und Darstellung photometrischer Daten von Lampen und Leuchten – Teil 1: Messung und Datenformat
DIN EN 13032-4:2015-08 (D): Licht und Beleuchtung - Messung und Darstellung photometrischer Daten von Lampen und Leuchten - Teil 4: LED-Lampen, -Module und -Leuchten
DIN – Leitfaden zur Angabe der Unsicherheit beim Messen
(Deutsche Übersetzung des „Guide to the Expression of Uncertainty in Measurement“)
1. Auflage 1995 Beuth Verlag GmbH Berlin, Wien, Zürich
DIN 5031-10 (2018) – Strahlungsphysik im optischen Bereich und Lichttechnik – Teil 10: Photobiologisch wirksame Strahlung, Größen, Kurzzeichen und Wirkungsspektren