TEST REPORT

Reference No.	:	WTD21F11129922N
Applicant	:	Blueview Elec-optic Tech Co., Ltd.
Address	:	No.1000, Section 2, 2nd Konggang Road, Southwest Aviation Industrial Development Zone, Shuangliu District, Chengdu City, Sichuan Province, P.R.China
Manufacturer	:	Same as Applicant
Address	:	Same as Applicant
Product Name	:	LED Strip
Model No.	:	FN-2110-490-24-40K-A10W1
Ratings	:	CV 24VDC, LED 5.3W
Regulation	:	COMMISSION REGULATION (EU) 2019/2020 COMMISSION REGULATION (EU) 2021/341 COMMISSION DELEGATED REGULATION (EU) 2019/2015 COMMISSION DELEGATED REGULATION (EU) 2021/340
Test standard	:	See following pages
Test Category	:	Entrusted Test
Date of Receipt sample	:	2021-06-06
Date of Test	:	2021-06-06 to 2021-11-29
Date of Issue	:	2021-11-29
Test Report Form No.	:	WPL-EU2020-02A
Test Result	:	See following pages

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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Test item description.....:	LED Strip
Type of test objects.....:	FN-2110-490-24-40K-A10W1
Trademark.....:	N/A
Subcontract / test (clause)…....:	N/A
Address……..…..:	N/A
Order description……..…..:	Evaluation ecodesign requirements and energy labelling of light sources according to (EU) 2019/2020, (EU) 2021/341, (EU) 2019/2015 and (EU) 2021/340.

Product information	
• Light sources	☒
Supplier's name or trade mark and address: ---	
Model identifier: FN-2110-490-24-40K-A10W1	
Type of light source:	
- Lighting technology used:	☐HL ☐LFL T5 HE ☐LFL T5 HO ☐CFLni ☐other FL ☐HPS ☐MH ☐other HID ☒LED ☐OLED ☐mixed_____ ☐other_____.
- Non-directional or directional:	☒NDLS ☐DLS
- Light source cap-type (or other electric interface):	☐- ☒N/A
- Mains or non-mains:	☐MLS ☒NMLS
- Connected light source (CLS):	☐yes ☒no
- Colour-tuneable light source:	☐yes ☒no
- Envelope:	☒no ☐second ☐non-clear
- High luminance light source:	☐yes ☒no
- Anti-glare shield:	☐yes ☒no
- Dimmable:	☐yes ☐only with specific dimmers ☒no

General product parameters

Energy consumption in on-mode [kWh/1000h]	6
Energy efficiency class	☐A ☐B ☐C ☐D ☐E ☐F ☒G
Useful luminous flux (Φ_{use}) [lm]	450
Beamangle correspondence	☒sphere360° ☐wide cone120° ☐narrow cone90°
Correlated colour temperature [K]	☒Single value ☐Range ☐Steps 4000
On-mode power (P_{on}) [W]	5.3
Standby power (P_{sb}) [W]	0.00
Networked standby power (P_{net}) for CLS [W]	☐- ☒N/A
Colour rendering index	90
Outer dimensions [mm]	Height: 1.35 ; Width:500 ; Depth: 10 (Supplier considered)
Spectral power distribution	See Appendix 2
Claim of equivalent power [W]	☐yes - ☒N/A
Chromaticity coordinates (x and y)	x = 0.380 y = 0.376

Peak luminous intensity [cd] *(directional)*	☐ - ☒N/A
Beam angle [°] *(directional)*	☐ - ☒N/A
R9 colour rendering index value *(LED and OLED)*	☒84 ☐N/A
Survival factor *(LED and OLED)*	☒ 1.00 ☐N/A
Lumen maintenance factor *(LED and OLED)*	☒ 0.96 ☐N/A
Displacement factor (cos φ1) *(LED and OLED mains)*	☐ - ☒N/A
Colour consistency in McAdam ellipses *(LED and OLED)*	☒ 5 ☐N/A
Claims that an LED light source replaces a fluorescent light source without integrated ballast of a particular wattage [W] *(LED and OLED mains)*	☐yes - ☒N/A
Flicker metric (Pst LM) *(LED and OLED mains)*	☐ - ☒N/A
Stroboscopic effect metric (SVM) *(LED and OLED mains)*	☐ - ☒N/A
Others (Light sources)	
Rated $L_{70}B_{50}$ life (hours)	30000

Possible test case verdicts

- test case does not apply to the test object.....: N or N/A (Not applicable)
- test object does meet the requirement.....: P(ass)
- test object does not meet the requirement.....: F(ail)
- the object does not need to tested or no checked.....: - or -- or ---

Copy of marking plate

Requirements of information refer to clause of this report.

General remark

"(see remark #)" refers to a remark appended to the report.
"(see appended table)" refers to a table appended to the report.
Throughout this report a point is used as the decimal separator.

1. The samples were pre-conditioned for 30 minutes and were performed at constant voltage 24V with dc-power.
2. The tests were performed with the sample in lighting-surface vertically downward position.
3. Detail information for models covered in this report as below list:

Product Type	Model	Rating	CCT	LED Type	Driver
LED Strip	FN-2110-490-24-40K-A10W1	CV 24VDC, LED 5.3 W	4000K	---	---

Test Method

All submitted samples were tested according to implementation measure the Commission regulation (EU) 2019/2020 and (EU) 2021/341 used in conjunction with Commission delegated regulation (EU) 2019/2015 and (EU) 2021/340.

Regulation:

COMMISSION REGULATION (EU) 2019/2020
laying down ecodesign requirements for light sources and separate control gears pursuant to Directive 2009/125/EC of the European Parliament and of the Council and repealing Commission Regulations (EC) No 244/2009, (EC) No 245/2009 and (EU) No 1194/2012.

COMMISSION REGULATION (EU) 2021/341
amending Regulations (EU) 2019/2020 with regard to ecodesign requirements for light sources and separate control gears.

COMMISSION DELEGATED REGULATION (EU) 2019/2015
supplementing Regulation (EU) 2017/1369 of the European Parliament and of the Council with regard to energy labelling of light sources and repealing Commission Delegated Regulation (EU) No 874/2012.

COMMISSION DELEGATED REGULATION (EU) 2021/340
amending Delegated Regulations (EU) 2019/2015 with regard to energy labelling requirements for light sources.

Test / Reference Standards:

☒(EU) 2019/2020 & (EU) 2021/341	☒(EU) 2019/2015 & (EU) 2021/340
☒EN 62612:2013/AC:2016-10/A1:2017/A11:2017/AC:2017/A2:2018	
☒EN 62717:2017/A2:2019	☒CIE 84:1989
☐EN 62722-2-1:2016	☒CIE 18.2:1983
☐IEC/TR 61547-1:2017	☒CIE 63:1984
☐IEC/TR 63158:2018 (CIE TN:006-2016)	☒CIE 15:2018
☐IEC/TR 61341:2010 & L2(AP)005	☒CIE 13.3:1995

Test Condition

Initial test and final flux measurement:
The measurements were made in a draught-free room at a temperature of 25 ± 1°C, a relative humidity of 65 % maximum, an average air velocity of less than 0.2 m/s and steady state operation of the light sources. The test voltage is stable within ± 0.5 %, during stabilization periods, this tolerance being ± 0.2 % at the moment of measurements. The total harmonic content of the supply voltage shall not exceed 3 %. The harmonic content is defined as the r.m.s. summation of the individual harmonic components using the fundamental as 100 %.

Endurance test:
The switching cycles are to be conducted in a room with an ambient temperature of 25 ± 10°C and an average air velocity of less than 0.2 m/s. The switching cycles on the sample shall be conducted in free air in a vertical base-up position. The applied voltage during the switching cycles shall have a tolerance within 2 %. The total harmonic content of the supply voltage shall not exceed 3 %. Standards provide guidance on the supply voltage source.

Photometric and Electrical Measurement

Integrating Sphere System:
The system includes AC power source, digital power meter, DC power supply, spectrophotometer, and integrating sphere. The system is calibrated by standard light source before measurement. The system and standard light source has been calibrated regularly and traceable to the National Primary Standards. The ambient temperature measured at inside the sphere.

The 4π geometry was used during measurement. The product was operated in its intended orientation in application and calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm, and was recorded in this report.

Goniophotometer System:
The system includes AC power source, digital power meter, DC power supply and goniophotometer. The system is calibrated by standard light source before measurement. The standard light source has been calibrated regularly and traceable to the National Primary Standards. The ambient temperature measured at a point not more than 1 m from the sample and at the same height as the sample.

The type C goniophotometer was used for measuring total luminous flux, luminous intensity distribution, and

color spatial uniformity. The product was operated in its intended orientation in application, and was recorded in this report.

Flicker Measurement

Equipment:

1) The photodetector used for photometric measurements shall be a silicon detector corrected to closely fit the Commission Internationale de l'Eclairage (CIE) spectral luminous efficiency curve (V). Ensure that the measurement equipment receives the appropriate voltage range from the photodetector, using an amplifier if necessary.
2) The equipment measurement period shall be ≥ 100 ms.
3) The equipment sampling rate used shall be ≥ 2 kHz.

Test Procedure:

a) Install the sample in the test environment without a dimmer in the circuit.
b) Set power supply to rated voltage and frequency of the device. If a range is specified, test sample at the midpoint of the range.
c) Apply rated voltage/frequency to the device.
d) If sample has been stabilized for measurements previously and the stabilization time recorded, the sample may be considered stabilized after operating for this period of time.
e) Record readings from measurement equipment to determine sample's light output periodic frequency. Calculate the flicker index and percent flicker, as applicable.
f) Remove power from sample.

The reported values of P_{st}, SVM show the highest value measured. the waveform digitizer used to capture the waveform data used for the calculation of the reported metrics must have:

Parameter		Units	Value
Dynamic range of waveform amplitude	P_{st}		≥ 1000:1 (60 dB)
	SVM		≥ 100:1 (40 dB)
Sampling Time	P_{st}	Seconds	≥ 180
	SVM	Seconds	≥ 1
Sampling Rate	P_{st}	kHz	≥ 10
	SVM	kHz	≥ 20
Temporal bandwidth (-3 dB cutoff frequency)	P_{st}	kHz	≥ 0.5
	SVM	kHz	≥ 5

COMMISSION REGULATION (EU) 2019/2020 and (EU) 2021/341					
Clause	Requirement + Test			Result – Remark	Verdict
Annex I	**Definitions applicable for the Annexes**				P
Annex II	**Ecodesign requirements**				P
	For the purposes of compliance and verification of compliance with the requirements of this Regulation, measurements and calculations shall be made using harmonised standards the reference numbers of which have been published for this purpose in the Official Journal of the European Union, or other reliable, accurate and reproducible methods, which take into account the generally recognised state-of-the-art.			See page 4	P
1.	**Energy efficiency requirements**				P
(a)	From 1 September 2021, the declared power consumption of a light source P_{on} shall not exceed the maximum allowed power P_{onmax}, defined as a function of the declared useful luminous flux Φ_{use} and the declared colour rendering index CRI as follows:			See appendix 1	P
	$P_{onmax} = C \times (L + \Phi_{use}/(F \times \eta)) \times R$			P_{onmax} = 5.57 W (Declared) 5.73 W(Measured)	P
	- The values for threshold efficacy (η) and end loss factor (L) are specified in below table, depending on the light source type.				P
	Table: Threshold efficacy (η) and end loss factor (L)				P
	Light source description	Threshold efficacy (η)	End loss factor (L)		P
	Organic light-emitting diode (OLED)	65.0	1.5	η = 120.0; L = 1.5	P
	Light-emitting diode (LED)	120.0	1.5		
	Connected LED light sources (LED CLS)	120.0	2.0		
	- Basic values for correction factor (C) depending on light source type, and additions to C for special light source features are specified in below table.				P
	Table: Correction factor C depending on light source characteristics				P
	Light source type	Basic C value			P
	Non-directional (NDLS) not operating on mains (NMLS)	1.00		C = 1.00	P
	Non-directional (NDLS) operating on mains (MLS)	1.08			
	Directional (DLS) not operating on mains (NMLS)	1.15			
	Directional (DLS) operating on mains (MLS)	1.23			
	Special light source feature	Bonus on C			P
	DLS with anti-glare shield	+0.20			N
	Colour-tuneable light source (CTLS)	+0.10			N
	High luminance light sources (HLLS)	+0.0058 × L-HLLS - 0.0167			N
	The bonus for HLLS shall not be combined with the basic C-value for DLS (basic C-value for NDLS shall be used for HLLS).				N
	- Efficacy factor (F) is:				P
	1.00 for non-directional light sources (NDLS, using total flux)			F = 1.00	P
	0.85 for directional light sources (DLS, using flux in a cone)				

COMMISSION REGULATION (EU) 2019/2020 and (EU) 2021/341				
Clause	Requirement + Test		Result – Remark	Verdict
	- CRI factor (R) is:			P
	0.65 for CRI ≤ 25;			N
	(CRI+80)/160 for CRI > 25, rounded to two decimals.		R = 1.06	P
	Light sources that allow the end-user to adapt the spectrum and/or the beam angle of the emitted light, thus changing the values for useful luminous flux, colour rendering index (CRI) and/or correlated colour temperature (CCT), and/or changing the directional/non-directional status of the light source, shall be evaluated using the reference control settings.			N
	The standby power P_{sb} of a light source shall not exceed 0.5 W.		See appendix 1	P
	The networked standby power P_{net} of a connected light source shall not exceed 0.5 W.			N
	The allowable values for P_{sb} and P_{net} shall not be added together.			N
2.	**From 1 September 2021, the functional requirements specified in below table shall apply for light sources:**			P
	Table: Functional requirements for light sources			P
	Colour rendering	CRI ≥ 80	See appendix 1 ☐For Lighting technology HID ☐Only for use in outdoor or industrial applications	P
		CRI > 0 for HID with Φ_{use} > 4 klm		
		CRI > 0 for light sources intended for Use in outdoor applications, industrial applications or other applications where lighting standards allow a CRI < 80		
	Displacement factor (DF, cos φ1) at power input Pon for LED and OLED MLS	No limit at $P_{on} \leqslant 5$ W	See appendix 1	N
		DF ≥ 0.5 at 5 W < P_{on} ≤ 10 W		
		DF ≥ 0,7 at 10 W < P_{on} ≤ 25 W		
		DF ≥ 0,9 at 25 W < P_{on}		
	Lumen maintenance factor (for LED and OLED)	The lumen maintenance factor X_{LMF}% after endurance testing according to Annex V at least $X_{LMF,MIN}$ % calculated as follows: $X_{LMF,MIN}\% = 100 \times e^{\frac{(3000 \times \ln(0.7))}{L_{70}}}$ If the calculated value for $X_{LMF,MIN}$ exceeds 96.0 %, an $X_{LMF,MIN}$ value of 96.0 % used.	$X_{LMF,MIN}$%= 96.0% See appendix 1	P
	Survival factor (for LED and OLED)	Light sources should be operational as specified in row 'Survival factor (for LED and OLED)' of Annex IV, Table 6, following the endurance testing given in Annex V.	See appendix 1	P
	Colour consistency for LED and OLED light sources	Variation of chromaticity coordinates within a six-step MacAdam ellipse or less.	See appendix 1	P
	Flicker for LED and OLED MLS	P_{st} LM ≤ 1.0 at full-load	See appendix 1	N
	Stroboscopic effect for LED and OLED MLS	SVM ≤ 0.9 at full-load; From 1 September 2024: SVM ≤ 0,4 at full-load	See appendix 1 ☐Only for before 1 September 2024 ☐Only for use in outdoor or industrial applications	N
		No limit for light sources intended for use in outdoor applications, industrial applications or other applications where lighting standards allow a CRI < 80		

COMMISSION REGULATION (EU) 2019/2020 and (EU) 2021/341			
Clause	Requirement + Test	Result – Remark	Verdict
3.	**Information requirements**	Supplier considered	---
	From 1 September 2021 the following information requirements shall apply:		---
(a)	Information to be displayed on the light source itself		---
	For all light sources, except CTLS, LFL, CFLni, other FL, and HID, the value and physical unit of the useful luminous flux (lm) and correlated colour temperature (K) shall be displayed in a legible font on the surface if, after the inclusion of safety-related information, there is sufficient space available for it without unduly obstructing the light emission.		---
	For directional light sources, the beam angle (°) shall also be indicated.		---
	If there is room for only two values, the useful luminous flux and the correlated colour temperature shall be displayed. If there is room for only one value, the useful luminous flux shall be displayed.		---
(b)	Information to be visibly displayed on the packaging		---
(1)	Light source placed on the market, not in a containing product		---
	If a light source is placed on the market, not in a containing product, in a packaging containing information to be visibly displayed at a point-of-sale prior to its purchase, the following information shall be clearly and prominently displayed on the packaging:		---
	(a) the useful luminous flux (Φuse) in a font at least twice as large as the display of the on-mode power (P_{on}), clearly indicating if it refers to the flux in a sphere (360°), in a wide cone (120°) or in a narrow cone (90°);		---
	(b) the correlated colour temperature, rounded to the nearest 100 K, also expressed graphically or in words, or the range of correlated colour temperatures that can be set;		---
	(c) the beam angle in degrees (for directional light sources), or the range of beam angles that can be set;		---
	(d) electrical interface details, e.g. cap- or connector-type, type of power supply (e.g. 230 V AC 50 Hz, 12 V DC);		---
	(e) the $L_{70}B_{50}$ lifetime for LED and OLED light sources, expressed in hours;		---
	(f) the on-mode power (P_{on}), expressed in W;		---
	(g) the standby power (P_{sb}), expressed in W and rounded to the second decimal. If the value is zero, it may be omitted from the packaging;		---
	(h) the networked standby power (P_{net}) for CLS, expressed in W and rounded to the second decimal. If the value is zero, it may be omitted from the packaging;		---
	(i) the colour rendering index, rounded to the nearest integer, or the range of CRI-values that can be set;		---
	(j) if CRI< 80, and the light source is intended for use in outdoor applications, industrial applications or other applications where lighting standards allow a CRI< 80, a clear indication to this effect.		---
	(k) if the light source is designed for optimum use in non-standard conditions (such as ambient temperature Ta ≠ 25 °C or specific thermal management is necessary): information on those conditions;		---

COMMISSION REGULATION (EU) 2019/2020 and (EU) 2021/341			
Clause	Requirement + Test	Result – Remark	Verdict
	(l) a warning if the light source cannot be dimmed or can be dimmed only with specific dimmers or with specific wired or wireless dimming methods. In the latter cases a list of compatible dimmers and/or methods shall be provided on the manufacturer's website;		---
	(m) if the light source contains mercury: a warning of this, including the mercury content in mg rounded to the first decimal place;		---
	(n) if the light source is within the scope of Directive 2012/19/EU, without prejudice to marking obligations pursuant to Article 14(4) of Directive 2012/19/EU, or contains mercury: a warning that it shall not be disposed of as unsorted municipal waste.		---
	Items (a) to (d) shall be displayed on the packaging in the direction meant to face prospective buyer; for other items this is also recommended, if space permits.		---
	For light sources that can be set to emit light with different characteristics, the information shall be reported for the reference control settings. In addition, a range of obtainable values may be indicated.		---
	The information does not need to use the exact wording on the list above. Alternatively, it may be displayed in the form of graphs, drawings or symbols.		---
(c)	Information to be visibly displayed on a free-access website of the manufacturer, importer or authorised representative		---
(d)	Technical documentation		---
Annex IV	**Verification procedure for market surveillance purposes**		---
Annex V	**Functionality after endurance testing**		P
	Models of LED- and OLED- light sources shall undergo endurance testing to verify their lumen maintenance and survival factor. This endurance testing consists of the test method outlined below. The authorities of a Member State shall test 10 units of the model for this test.		P
	The endurance test for LED and OLED light sources shall be conducted as follows:		P
	(a) Ambient conditions and test setup		P
	(b) Endurance test method	Switching 1200 cycles, 150 minutes switched ON and 30 minutes switched OFF	P

COMMISSION DELEGATED REGULATION (EU) 2019/2015 and (EU) 2021/340			
Clause	Requirement + Test	Result – Remark	Verdict
Annex I	**Definitions applicable for the Annexes**		P
Annex II	**Energy efficiency classes and calculation method**		P
	The energy efficiency class of light sources shall be determined as set out in below table, on the basis of the total mains efficacy η_{TM}, which is calculated by dividing the declared useful luminous flux Φ_{use} by the declared on-mode power consumption P_{on} and multiplying by the applicable factor F_{TM} of below table, as follows:	See appendix 1	P
	$\eta_{TM} = (\Phi_{use}/P_{on}) \times F_{TM}$ (lm/W)		P
	Table: Energy efficiency classes of light sources		P
	Energy efficiency class / Total mains efficacy η_{TM} (lm/W)		P
	A: $210 \le \eta_{TM}$	EE Class: G	P
	B: $185 \le \eta_{TM} < 210$		
	C: $160 \le \eta_{TM} < 185$		
	D: $135 \le \eta_{TM} < 160$		
	E: $110 \le \eta_{TM} < 135$		
	F: $85 \le \eta_{TM} < 110$		
	G: $\eta_{TM} < 85$		
	Table: Factors F_{TM} by light source type		P
	Light source type / Factor F_{TM}		P
	Non-directional (NDLS) operating on mains (MLS): 1.000	F_{TM} =0.926	P
	Non-directional (NDLS) not operating on mains (NMLS): 0.926		
	Directional (DLS) operating on mains (MLS): 1.176		
	Directional (DLS) not operating on mains (NMLS): 1.089		
Annex III	**Label for light sources**	Supplier considered	---
1.	**LABEL**		---
	If the light source is intended to be marketed through a point of sale, a label produced in the format and containing information as set out in this Annex is printed on the individual packaging.		---
1.1	Standard-sized label		--
1.2	Small-sized label		
1.3	The information shall be included in the label for light sources		---
2.	**LABEL DESIGNS**		---
2.1	Standard-sized label		---
2.2	Small-sized label		
2.3	Whereby		---
Annex V	**Product information**	Supplier considered	---
1.	**Product information sheet**		---
1.1	Pursuant to point 1(b) of Article 3, the supplier shall enter into the product database the information as set out in page 2-3 of this test report, including when the light source is a part in a containing product.	See page 2-3	---

	For light sources that can be tuned to emit light at full-load with different characteristics, the values of parameters that vary with these characteristics shall be reported at the reference control settings.		---
	If the light source is no longer placed on the EU market, the supplier shall put in the product database the date (month, year) when the placing on the EU market stopped.		---
2.	**Information to be displayed in the documentation for a containing product**		---
	If a light source is placed on the market as a part in a containing product, the technical documentation for the containing product shall clearly identify the contained light source(s), including the energy efficiency class.		---
	If a light source is placed on the market as a part in a containing product, the following text shall be displayed, clearly legible, in the user manual or booklet of instructions:		---
	'This product contains a light source of energy efficiency class <X>' where <X> shall be replaced by the energy efficiency class of the contained light source.		---
	If the product contains more than one light source, the sentence can be in the plural, or repeated per light source, as suitable.		---
3.	**Information to be displayed on the supplier's free access website:**		---
	(a) The reference control settings, and instructions on how they can be implemented, where applicable;		---
	(b) Instructions on how to remove lighting control parts and/or non-lighting parts, if any, or how to switch them off or minimize their power consumption;		---
	(c) If the light source is dimmable: a list of dimmers it is compatible with, and the light source — dimmer compatibility standard(s) it is compliant with, if any;		---
	(d) If the light source contains mercury: instructions on how to clean up the debris in case of accidental breakage;		---
	(e) Recommendations on how to dispose of the light source at the end of its life in line with Directive 2012/19/EU of the European Parliament and of the Council		---
Annex VI	**Technical documentation**	Supplier considered	---
1.	The technical documentation referred to in point 1(d) of Article 3 shall include:		---
	(a) the name and address of the supplier;		---
	(b) supplier's model identifier;		---
	(c) the model identifier of all equivalent models already placed on the market;		---
	(d) identification and signature of the person empowered to bind the supplier;		---
	(e) the declared values for the following technical parameters; these values are considered as the declared values for the purpose of the verification procedure in Annex IX:	See page 2-3 or appendix 1	---
	(1) useful luminous flux (Φ_{use}) in lm;		---
	(2) colour rendering index (CRI);		---

	(3) on-mode power (P_{on}) in W;		---
	(4) beam angle in degrees for directional light sources (DLS);		---
	(4a) peak luminous intensity in cd for directional light sources (DLS);		---
	(5) correlated colour temperature (CCT) in K;		---
	(6) standby power (P_{sb}) in W, including when it is zero;		---
	(7) networked standby power (P_{net}) in W for connected light sources (CLS);		---
	(7a) R9 colour rendering index value for LED and OLED light sources;		---
	(7b) survival factor for LED and OLED light sources;		---
	(7c) lumen maintenance factor for LED and OLED light sources;		---
	(7d) indicative lifetime L70B50 for LED and OLED light sources;		---
	(8) displacement factor (cos φ1) for LED and OLED mains light sources;		---
	(9) colour consistency in MacAdam ellipse steps for LED and OLED light sources;		---
	(10) luminance-HLLS in cd/mm^2 (only for HLLS)		---
	(11) flicker metric (P_{st}LM) for LED and OLED light sources;		---
	(12) stroboscopic effect metric (SVM) for LED and OLED light sources;		---
	(13) excitation purity, only for CTLS, for the following colours and dominant wavelength within the given range: Colour Dominant wave-length range Blue 440 nm — 490 nm Green 520 nm — 570 nm Red 610 nm — 670 nm		---
	(f) the calculations performed with the parameters, including the determination of the energy efficiency class;		---
	(g) references to the harmonised standards applied or other standards used;		---
	(h) testing conditions if not described sufficiently in point (g);		---
	(i) the reference control settings, and instructions on how they can be implemented, where applicable;		---
	(j) instructions on how to remove lighting control parts and/or non-lighting parts, if any, or how to switch them off or minimise their power consumption during light source testing;		---
	(k) specific precautions that shall be taken when the model is assembled, installed, maintained or tested.		---
Annex VII	**Information to be provided in visual advertisements, in technical promotional material and in distance selling, except distance selling on the internet**	Supplier considered	---
Annex VIII	**Information to be provided in the case of distance selling on the internet**	Supplier considered	

Appendix 1-Summary of Test

Summary of testing period
1. ☒ Report for initial test.
2. ☒ The previous report -- is replaced by this report. The 3600 hours endurance tests of equipment under test (EUT) are updated in this report.

Summary of Test Results					
Parameter	Declared value	Determined value (Arithmetic mean)			Verdict
		☒Main test	☐Auxiliary test	☐Auxiliary test	
On-mode power P_{on} [W]	5.3	5.25	---	---	P
Displacement factor [0-1]	---	---	---	---	N
Useful luminous flux Φuse [lm]	450	450.71	---	---	P
No-load power P_{no} [W]	---	---			N
Standby power P_{sb} [W]	0	0			P
Networked standby power P_{net} [W]	---	---			N
CRI Ra [0-100]	90	94.4	---	---	P
CRI R9 [0-100]	84	84	---	---	P
Flicker [P_{st} LM]	---	---	---	---	N
Stroboscopic effect [SVM]	---	---	---	---	N
Colour consistency [MacAdam ellips steps]	5	2.4	---	---	P
Beam angle [°]	---	---	---	---	N
Total mains efficacy η_{TM} [lm/W]	78.62	79.53	---	---	P
Lumen maintenance factor (for LED and OLED)	0.96	0.9686	---	---	P
Survival factor (for LED and OLED)	1.00	1.00	---	---	P
Excitation purity [%]	---	---	---	---	N
Correlated colour temperature [K]	400	3955	---	---	P
Peak luminous intensity [cd]	---	---	---	---	N

Note:
☒ **Main test at full-load* of the light source**
☒ **'full-load' means the condition of a light source, within the declared operating conditions, in which it emits the maximum (undimmed) luminous flux.**
☐ **Auxiliary test at other CCTs of the light source.**

Appendix 2-Test Data Sheet

Test Data Sheet 1: Energy Efficiency

Model: FN-2110-490-24-40K-A10W1					
Sample No.	Full-load on-mode power P_{on} [W]	Useful luminous flux Φ_{use} (sphere 360°wide cone) [lm]	Efficacy based on Φ_{use} [lm/W]	Total mains efficacy η_{TM} [lm/W]	Standby power P_{sb} [W]
1	5.25	454.91	86.72	80.30	0.00
2	5.20	455.26	87.58	81.10	0.00
3	5.28	454.56	86.11	79.74	0.00
4	5.29	459.50	86.83	80.40	0.00
5	5.26	450.02	85.52	79.19	0.00
6	5.18	459.00	88.54	81.99	0.00
7	5.27	443.43	84.13	77.90	0.00
8	5.25	445.99	84.98	78.69	0.00
9	5.23	441.44	84.37	78.13	0.00
10	5.27	443.02	84.08	77.86	0.00
Arithmetic mean	**5.25**	**450.71**	**85.89**	**79.53**	**0.00**

Test Data Sheet 2: Functional

Model: FN-2110-490-24-40K-A10W1					
Sample No.	Colour rendering index (CRI)	Colour consistency (SDCM) [step]	Displacement factor (DF, cosφ1)	Flicker (P_{st} LM)	Stroboscopic effect (SVM)
1	94.4	2.4	---	---	---
2	94.5	2.5	---	---	---
3	94.3	2.4	---	---	---
4	94.5	2.4	---	---	---
5	94.4	2.3	---	---	---
6	94.5	2.3	---	---	---
7	94.3	2.4	---	---	---
8	94.3	2.4	---	---	---
9	94.4	2.5	---	---	---
10	94.4	2.4	---	---	---
Arithmetic mean	**94.4**	**2.4**	**---**	**---**	**---**

Test Data Sheet 3: Functional-Continued

Model: FN-2110-490-24-40K-A10W1					
Sample No.	Total luminous flux Φ_{Total} [lm]	Total luminous flux at ON 3000 hours [lm]	Lumen maintenance factor (X_{LMF}%)	Switching cycles (1200 cycles)	Survival factor
1	454.91	441.99	97.16%	Pass	Pass
2	455.26	442.24	97.14%	Pass	Pass
3	454.56	442.24	97.29%	Pass	Pass
4	459.50	443.51	96.52%	Pass	Pass
5	450.02	437.06	97.12%	Pass	Pass
6	459.00	445.69	97.10%	Pass	Pass
7	443.43	428.49	96.63%	Pass	Pass
8	445.99	431.72	96.80%	Pass	Pass
9	441.44	426.08	96.52%	Pass	Pass
10	443.02	426.89	96.36%	Pass	Pass
Arithmetic mean	**450.71**	**436.59**	**96.86%**	**Pass**	**1.00**

Test Data Sheet 4: Other Parameter

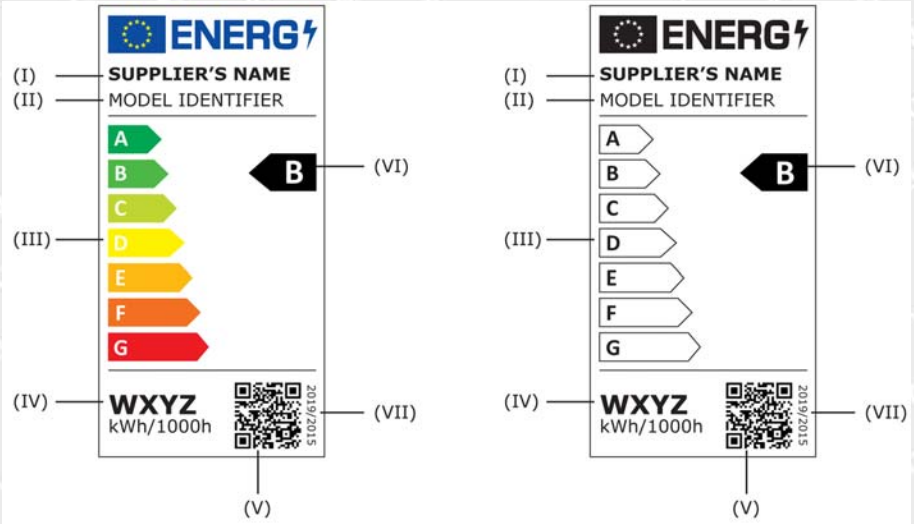
Model: FN-2110-490-24-40K-A10W1			
Sample No.	Power factor (PF)	R9 colour rendering index	Correlated colour temperature CCT [K]
1	1.00	84	3992
2	1.00	83	3938
3	1.00	83	3968
4	1.00	83	3942
5	1.00	84	3967
6	1.00	84	3953
7	1.00	84	3951
8	1.00	84	3946
9	1.00	84	3956
10	1.00	83	3941
Arithmetic mean	**1.00**	**84**	**3955**

Test Data Sheet 5: Other Parameter-Continued (Arithmetic mean)

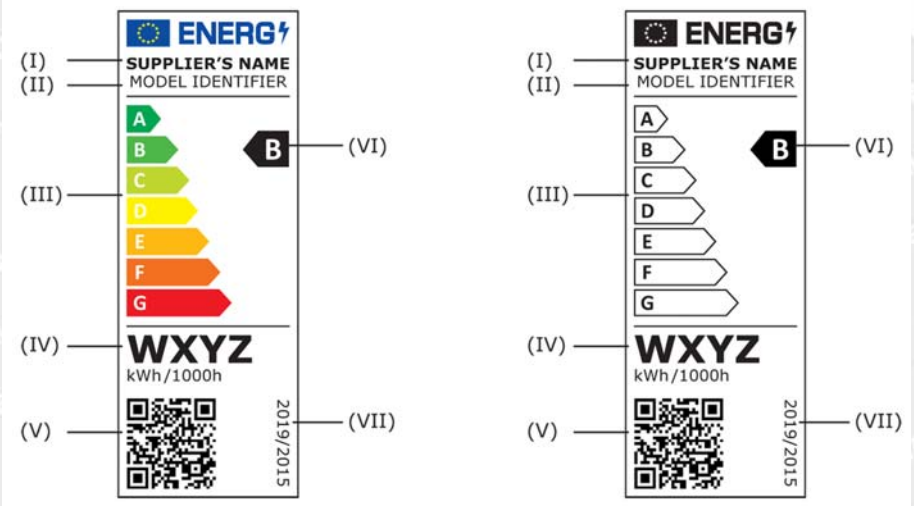
Model: FN-2110-490-24-40K-A10W1	
Beam angle [°]	113.3
Peak luminous intensity [cd]	156.6

Test Data Sheet 6: Energy efficiency classes and Label

Model: FN-2110-490-24-40K-A10W1	
Total mains efficacy η_{TM} (lm/W)	(450/5.3)×0.926 = 78.62 (Declared)
Energy efficiency classes	G
Energy consumption [kWh/1000h]	6 (Declared)
Label sample	
Standard-sized label	



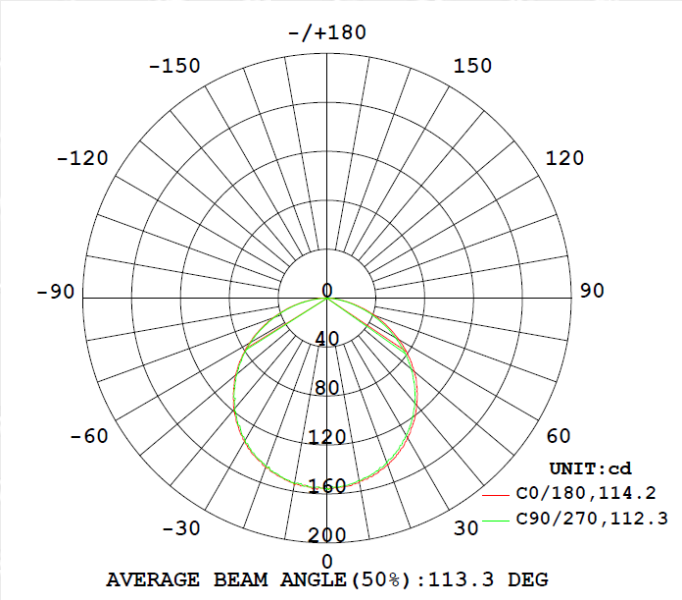
Small-sized label



I. supplier's name or trade mark: --
II. supplier's model identifier: --
III. scale of energy efficiency classes from A to G
IV. the energy consumption: 6 kWh/1000h
V. QR-code (quick response): means a matrix barcode included on the energy label of a product model that links to that model's information in the public part of the product database.
VI. the energy efficiency class: G
VII. the number of this Regulation that is '2019/2015'.

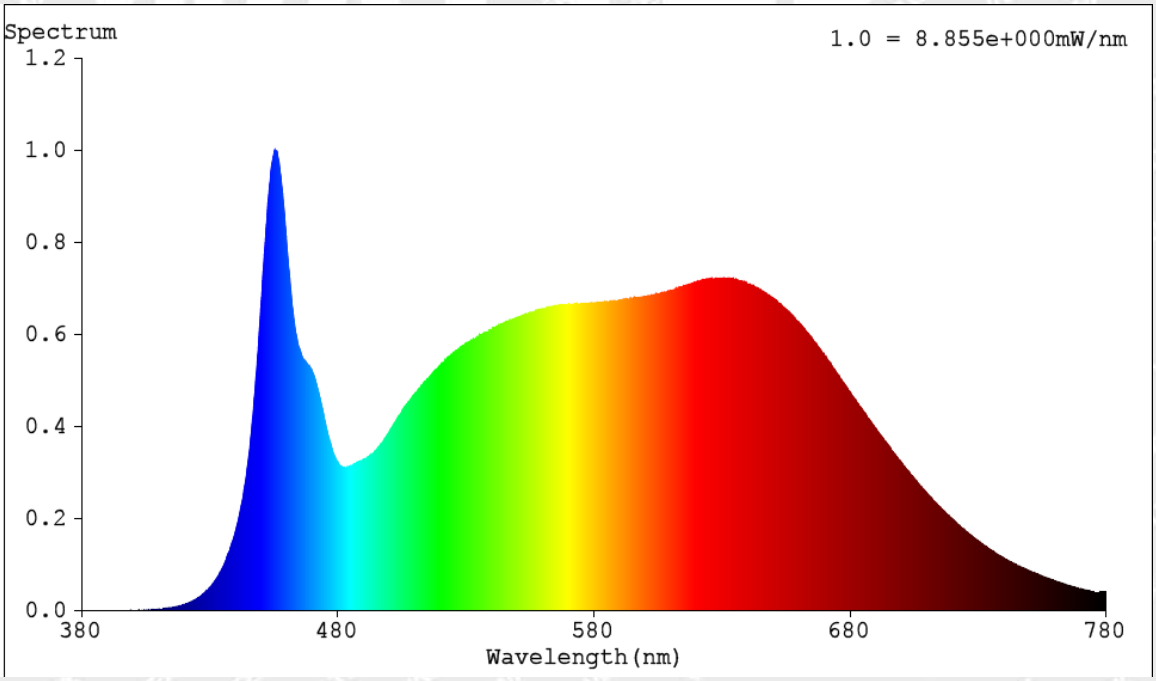
Test Data Sheet 7: Luminous intensity distribution diagram

Model: FN-2110-490-24-40K-A10W1



Test Data Sheet 8: Spectral power distribution

Model: FN-2110-490-24-40K-A10W1



Attachment 1: Equipment List

Equipment	Model/Type	Cal. Due. Date
Temperature & Humidity Datalogger	Testo 608-H1	2022-01-12
Color luminance meter	EVERFINE CBM-8	2022-01-24
AC power supply	EVERFINE TPS-500B	2022-01-17
DC power supply	EVERFINE WY305-V1	2022-01-17
Power meter	EVERFINE PF2010A-V1-CAN	2022-01-17
High Accuracy Array Spectroradiometer	EVERFINE HAAS-2000	2022-01-17
Integrating Sphere	EVERFINE R98/R80/0.3m	2022-01-17
Standard light source	EVERFINE D204	2022-01-24
Standard light source	EVERFINE D062	2022-01-17
AC power supply	EVERFINE DPS 1060	2022-01-17
DC power supply	EVERFINE WY12010	2022-01-17
Digital Power Meter	EVERFINE PF2010A-V1	2022-01-17
Goniophotometer	EVERFINE GO R5000-2M2D	2022-01-17
Standard lamp	EVERFINE 28V/10A/500cd	2022-01-24
Standard lamp	EVERFINE D908	2022-01-17
Light sources flicker analyzer	EVERFINE LFA-3000	2022-01-24

Attachment 2: Photo document

Model: FN-2110-490-24-40K-A10W1

Photo 1

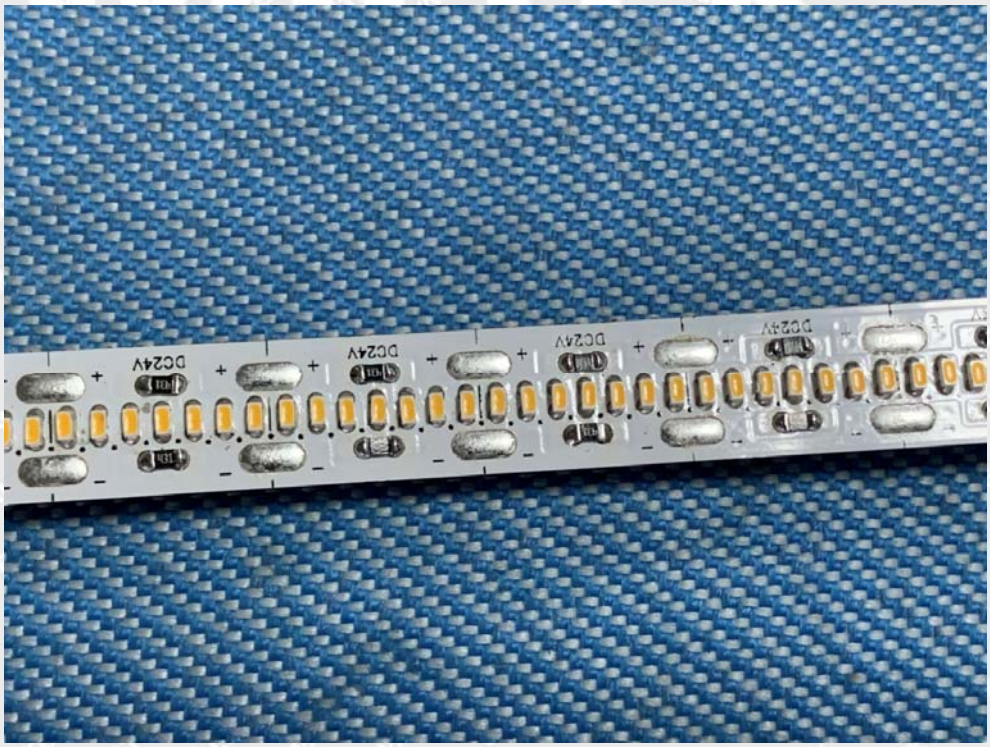


Photo 2

====== End of Report ======