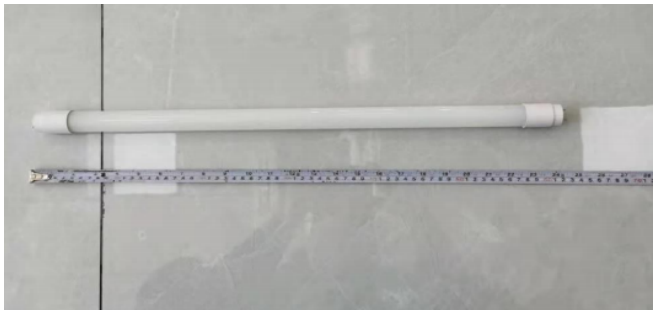
Prüfbericht-Nr.: *Test report no.:*	CN23FR2N 126	**Auftrags-Nr.:** *Order no.*:	180256467	Seite 1 von 23 *Page 1 of 23*
Kunden-Referenz-Nr.: *Client reference no.:*	N/A	**Auftragsdatum:** *Order date:*	2022-10-23	
Auftraggeber: *Client:*	Zhejiang Meka Optoelectronic Co., Ltd NO.8 Canghai Road,Lihai Town,Binhai New City,Shaoxing,zhejiang Province			
Prüfgegenstand: *Test item:*	LED Tube			
Bezeichnung / Typ-Nr.: *Identification / Type no.:*	See "General product information"			
Auftrags-Inhalt: *Order content*:	Testing report			
Prüfgrundlage: *Test specification:*	Regulation (EU) 2017/1369 COMMISSION REGULATION (EU) 2019/2020 COMMISSION DELEGATED REGULATION (EU) 2019/2015 COMMISSION DELEGATED REGULATION (EU) 2021/340 and COMMISSION REGULATION (EU) 2021/341 also considered			
Wareneingangsdatum: *Date of sample receipt:*	2022-10-23			
Prüfmuster-Nr.: *Test sample no:*	180256467			
Prüfzeitraum: *Testing period:*	2022-11-01 - 2023-03-31			
Ort der Prüfung: *Place of testing:*	Zhejiang Meka Optoelectronic Co., Ltd			
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland / CCIC (Ningbo) Co., Ltd.			
Prüfergebnis*: *Test result*:*	Pass			



geprüft von: *reviewed by:* Shiyi Wang
Signed by: Shiyi Wang
Datum: *Date:* 2023-04-21
Stellung / *Position:* Project Engineer

genehmigt von: *authorized by:* Kitty Cheng
Signed by: Kitty Cheng
Ausstelldatum: *Issue date:* 2023-04-21
Stellung / *Position:* Reviewer

Sonstiges / *Other:*
The requirements of 2019/2020 for light source and control gear were performed and 3600H test results see test report. Energy efficiency class according to COMMISSION DELEGATED REGULATION (EU) 2019/2015 is also considered, and the result is for reference.
Appendix III: Measuring Instruments and Test Equipments. Appendix IV: Photo of tested samples.

Zustand des Prüfgegenstandes bei Anlieferung: Prüfmuster vollständig und unbeschädigt
Condition of the test item at delivery: *Test item complete and undamaged*

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
** Legend:*	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.
This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.
V05

TEST REPORT

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

Test item particulars:	
Product name	LED Tube
Model name :	See “General product information”
Trade Mark	MKOPTO
Manufacturer	Zhejiang Meka Optoelectronic Co., Ltd
address	NO.8 Canghai Road, Lihai Town, Binhai New City, Shaoxing 312300 zhejiang Province P.R. China
Factory	Zhejiang Meka Optoelectronic Co., Ltd
address	NO.8 Canghai Road, Lihai Town, Binhai New City, Shaoxing 312300 zhejiang Province P.R. China

Declare value description:	
Rated input:	See “General product information”
Rated wattage :	See “General product information”
Nominal luminous flux Φ:	See “General product information”
Declared ηTM (lm/W) :	See “General product information”
Declared Colour rendering (CRI) :	80
Declared Displacement factor for LED and OLED MLS(DF) :	5W<Pon≤10W, DF≥0.5
Declared Lumen maintenance factor for LED and OLED :	95.81%
Declared Survival factor for LED and OLED:	≥90%
Declared colour consistency for LED and OLED :	≤6
Declared beam angle for DLS :	N/A
Declared lamp life :	25000H
Declared color temperature :	6500K
Declared chromaticity co-ordinates :	x=0.313, y=0.337(F6500K)
Declared Flicker for LED and OLED MLS :	≤1,0
Declared Stroboscopic effect for LED and OLED MLS :	≤ 0,4 at full-load (From 1 September 2024: SVM ≤ 0,4 at full-load)

Possible test case verdicts:

- test case does not apply to the test object ..... N/A
- test object does meet the requirement..... P(Pass)
- test object does not meet the requirement ..... F(Fail)

- **Test Report Form No**..... Ver. 2.1
- TRF Originator..... TÜV Rheinland / CCIC (Ningbo) Co., Ltd.
- Master TRF..... Dated 2022-03

General product information:

Below models are LED Tube, details see below table:

Table 1:Light source

Model name	Rated voltage and rated frequency	Input current	Declared color temperature	Energy consumption
MK-020011003398—F	AC 220-240V, 50/60Hz	0.66A	6500K	9 kWh/1000 h

Table 2: Light source

Model name	Rated wattage	Ponmax	Nominal luminous flux	Declared ηTM	Declare Energy efficiency class
MK-020011003398—F	9W	10.14W	947 lm	105.2 lm/W	Class F

Summary of testing:

Model name	Testing condition	Testing period
MK-020011003398—F	AC 230V. 50Hz	3600H

Copy of rating label:

N/A

ANNEX II: Ecodesign requirements			
Test item	**Requirement**	**Result**	**Verdict**
1.Energy efficiency requirements:			
(a): Light source	From 1 September 2021. the declared power consumption of a light source Pon shall not exceed the maximum allowed power Ponmax (in W). defined as a function of the declared useful luminous flux Φuse (in lm) and the declared colour rendering index CRI (-) as follows: Ponmax= Cx(L+ Φuse/(Fxη))xR		☒P ☐F ☐N/A ☐Under testing
	The standby power Psb of a light source shall not exceed 0.5 W.		☐P ☐F ☒N/A ☐Under testing
	The networked standby power Pnet of a connected light source shall not exceed 0.5 W. The allowable values for Psb and Pnet shall not be added together.		☐P ☐F ☒N/A ☐Under testing
(b): Control gear	From 1 September 2021. the values set in Table 3 for the minimum energy efficiency requirements of a separate control gear operating at full-load shall apply: Details see Table 3: Minimum energy efficiency for separate control gear at full-load		☐P ☐F ☒N/A ☐Under testing
	The no-load power Pno of a separate control gear shall not exceed 0.5 W. This applies only to separate control gear for which the manufacturer or importer has declared in the technical documentation that it has been designed for no-load mode.		☐P ☐F ☒N/A ☐Under testing
	The standby power Psb of a separate control gear shall not exceed 0.5 W.		☐P ☐F ☒N/A ☐Under testing
	The networked standby power Pnet of a connected separate control gear shall not exceed 0.5 W. The allowable values for Psb and Pnet shall not be added together.		☐P ☐F ☒N/A ☐Under testing
2.Functional requirements:			

	From 1 September 2021. the functional requirements specified in Table 4 shall apply for light sources: Table 4: Functional requirements for light sources		☒P ☐F ☐N/A ☐Under testing
Colour rendering	CRI ≥ 80 (except for HID with Φuse > 4 klm and for light sources intended for use in outdoor applications. industrial applications or other applications where lighting standards allow a CRI< 80. when a clear indication to this effect is shown on the light source packaging and in all relevant printed and electronic documentation)		☒P ☐F ☐N/A ☐Under testing
Displacement factor (DF. cos φ1) at power input Pon for LED and OLED MLS	No limit at Pon ≤ 5 W. DF ≥ 0.5 at 5 W < Pon ≤ 10 W. DF ≥ 0.7 at 10 W < Pon ≤ 25 W DF ≥ 0.9 at 25 W < Pon		☒P ☐F ☐N/A ☐Under testing
Lumen maintenance factor (for LED and OLED)	The lumen maintenance factor XLMF% after endurance testing according to Annex V shall be at least XLMF.MIN % calculated as follows: XLMF.MIN%=100×e(3000×ln(0.7))L70 where L70 is the declared L70B50 lifetime (in hours) If the calculated value for XLMF.MIN exceeds 96.0 %. an XLMF.MIN value of 96.0 % shall be used		☒P ☐F ☐N/A ☐Under testing
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.		☒P ☐F ☐N/A ☐Under testing
Colour consistency for LED and OLED light sources	Variation of chromaticity coordinates within a six-step MacAdam ellipse or less.		☒P ☐F ☐N/A ☐Under testing
Flicker for LED and OLED MLS	Pst LM ≤ 1.0 at full-load		☒P ☐F ☐N/A ☐Under testing
Stroboscopic effect for LED	SVM ≤ 0.9 at full-load (except for light sources intended for use in outdoor applications.		☒P

and OLED MLS	industrial applications or other applications where lighting standards allow a CRI < 80) From 1 September 2024: SVM ≤ 0.4 at full-load (except for light sources intended for use in outdoor applications. industrial applications or other applications where lighting standards allow a CRI < 80)'		☐ F ☐ N/A ☐ Under testing
3.Information requirements:			
	From 1 September 2021 the following information requirements shall apply: (a) Information to be displayed on the light source itself (b) Information to be visibly displayed on the packaging (c) Information to be visibly displayed on a free-access website of the manufacturer. importer or authorised representative (d) Technical documentation (e) Information for products specified in point 3 of Annex III		☐ P ☐ F ☐ N/A ☒ Not checked

Appendix I: Test results--Tabel 1: Initial test results:

MK-020011003398—F		Test Result					P	
Sample No.	Measured voltage(V)	Measured current (mA)	Measured Pon(W)	Initial Ponmax	Initial Φuse (lm)	CCT	Beam angle (°)	R9
1#	230.46	66.60	8.8	10.3	967.8	6517	--	2
2#	230.47	66.70	8.8	10.4	981.1	6517	--	2
3#	230.50	66.50	8.7	10.5	986.8	6514	--	2
4#	230.49	66.30	8.7	10.5	989.6	6514	--	2
5#	230.47	66.40	8.9	10.5	988.7	6514	--	2
6#	230.44	66.30	8.7	10.4	977.3	6517	--	2
7#	230.47	66.40	8.5	10.4	970.7	6514	--	2
8#	230.43	66.30	8.8	10.3	964.0	6514	--	2
9#	230.48	66.70	8.6	10.3	961.2	6517	--	2
10#	230.47	66.80	8.6	10.4	971.6	6517	--	2
Average	**230.47**	**66.50**	**8.7**	**10.4**	**975.88**	**6516**	**--**	2
Sample No.	Colour rendering (CRI)	Displacement factor(DF)	Colour consistency	Flicker(Pst LM)	Stroboscopic effect(SVM)	Standby power(W)	X	Y
1#	80.9	0.62	2.1	0.009	0.013	--	0.3130	0.3355
2#	81.0	0.62	2.2	0.007	0.011	--	0.3131	0.3353
3#	82.9	0.62	2.1	0.007	0.010	--	0.3133	0.3354
4#	82.9	0.62	2.3	0.010	0.011	--	0.3132	0.3351
5#	82.9	0.62	2.2	0.006	0.012	--	0.3133	0.3353
6#	81.0	0.62	2.3	0.009	0.016	--	0.3131	0.3351
7#	80.9	0.62	2.2	0.009	0.013	--	0.3132	0.3354
8#	82.9	0.62	2.2	0.013	0.013	--	0.3133	0.3353
9#	80.0	0.62	2.2	0.011	0.014	--	0.3132	0.3352
10#	81.0	0.62	2.2	0.009	0.013	--	0.3133	0.3353
Average	**82.9**	**0.62**	**2.2**	**0.009**	**0.013**	**--**	**0.3132**	**0.3353**
Required	**CRI≥80**	**≥0.7**	**SDCM≤6**	**Pst LM≤1.0**	**SVM≤0.4**	**<0.5W**	**--**	**--**

Tabel 2: Initial test results:

MK-020011003398—F		Test Result					P
Sample No.	Initial Φuse (lm)	Efficacy factor (F)	CRI factor (R)	Threshold efficacy (η)	End loss factor (L)	Correction factor (C)	Initial Ponmax
1#	967.8	1.00	1.08	120.0	1.5	1.08	10.3
2#	981.1	1.00	1.08	120.0	1.5	1.08	10.4
3#	986.8	1.00	1.08	120.0	1.5	1.08	10.5
4#	989.6	1.00	1.08	120.0	1.5	1.08	10.5
5#	988.7	1.00	1.08	120.0	1.5	1.08	10.5
6#	977.3	1.00	1.08	120.0	1.5	1.08	10.4
7#	970.7	1.00	1.08	120.0	1.5	1.08	10.4
8#	964.0	1.00	1.08	120.0	1.5	1.08	10.3
9#	961.2	1.00	1.08	120.0	1.5	1.08	10.3
10#	971.6	1.00	1.08	120.0	1.5	1.08	10.4
Average	**975.88**	**1.00**	**1.08**	**120.0**	**1.5**	**1.08**	**10.4**
Factor	N/A	☒1.00 for NDLS ☐0.85 for DLS	☐0.65 for CRI≤25. ☒(CRI+80)/160 for CRI>25	120.0 for LED	☒1.5 for LED ☐2.0 for connected light sources	☐NDLS & NMLS: 1.00 ☒NDLS & MLS: 1.08 ☐DLS & NMLS: 1.15 ☐DLS & MLS: 1.23	Ponmax= Cx(L+ Φuse/(Fx η))xR

Tabel 3: Initial test results for Energy efficiency classes:

MK-020011003398—F		Test Result				P
Sample No.	Initial Φuse (lm)	Initial Pon(W)	F_{TM}	Initial ηTM (lm/W)	Test Energy efficiency class	Declare Energy efficiency class
1#	967.8	8.8	1.00	109.95	F	F
2#	981.1	8.8	1.00	111.69	E	F
3#	986.8	8.7	1.00	112.80	E	F
4#	989.6	8.7	1.00	113.94	E	F
5#	988.7	8.9	1.00	111.64	E	F
6#	977.3	8.7	1.00	112.88	E	F
7#	970.7	8.5	1.00	114.13	E	F
8#	964.0	8.8	1.00	109.52	F	F
9#	961.2	8.6	1.00	111.83	E	F
10#	971.6	8.6	1.00	112.92	F	F
Average	**975.88**	**8.7**	1.00	112.13	**E**	**F**

Energy efficiency class:

A: 210 ≤ ηTM
B: 185 ≤ ηTM < 210
C: 160 ≤ ηTM < 185
D: 135 ≤ ηTM < 160
E: 110 ≤ ηTM < 135
F: 85 ≤ ηTM < 110
G: ηTM < 85

Factors FTM by light source type:

☒ NDLS & MLS: 1.00
☐ NDLS & NMLS: 0.926
☐ DLS & MLS: 1.176
☐ DLS & NMLS: 1.089

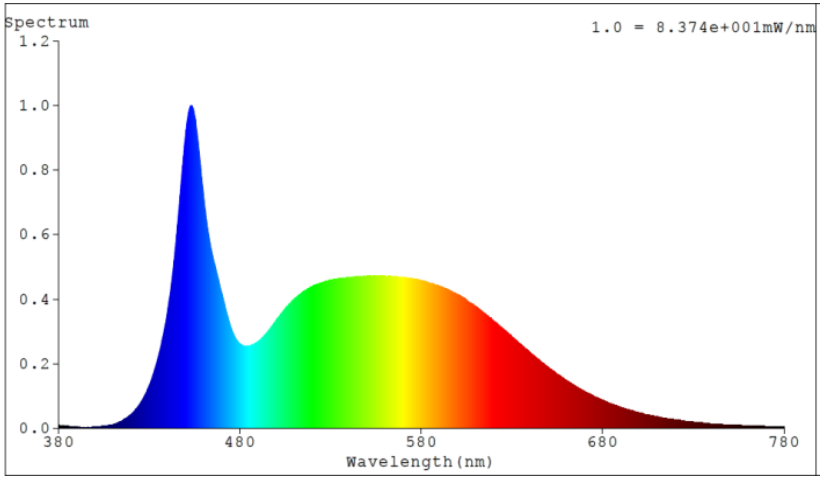
Table 4: Test results of survival factor and Lumen maintenance:

MK-020011003398—F	Test Result			P
Sample No.	Initial Φuse (lm)	3600H Φuse (lm)	XLMF.MIN% at 3600H	survival factor at 3600H
1#	967.8	931.31	96.23%	Yes
2#	981.1	946.57	96.48%	Yes
3#	986.8	948.12	96.08%	Yes
4#	989.6	957.24	96.73%	Yes
5#	988.7	955.08	96.60%	Yes
6#	977.3	937.52	95.93%	Yes
7#	970.7	932.26	96.04%	Yes
8#	964.0	925.73	96.03%	Yes
9#	961.2	924.00	96.13%	Yes
10#	971.6	933.51	96.08%	Yes
Average	**975.88**	**939.13**	**96.23%**	**`100%**
Required	**--**	**--**	**≥95.81%**	**≥90%**

Table 5: Test results of No-load power(Pno). Standby power(Psb). Networked standby power(Pnet) and energy efficiency for control gear

-		Test Result						N/A
Sample No.	Measured voltage(V)	Measured current (mA)	Input wattage (W)	Output wattage (W)	Energy efficiency	Pno (W)	Psb (W)	Pnet (W)
1#	--	--	--	--	--	--	--	--
2#	--	--	--	--	--	--	--	--
3#	--	--	--	--	--	--	--	--
Average	--	--	--	--	--	--	--	--
Required	--	--	--	--	--	**<0.5W**	**<0.5W**	**<0.5W**

Table 6: Spectrum

MK-020011003398—F


COMMISSION REGULATION (EU) 2019/2020:

3. Information requirements

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 (Pon). 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 L70B50 lifetime for LED and OLED light sources. expressed in hours;

(f) the on-mode power (Pon). expressed in W;

(g) the standby power (Psb). 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 (Pnet) 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. For HID light sources with useful luminous flux > 4 000 lm. this indication is not mandatory;

(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;

(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.

(2) Separate control gears:

If a separate control gear is placed on the market as a stand-alone product and not as a part of a containing product. in a packaging containing information to be visibly displayed to potential buyers. prior to their purchase. the following information shall be clearly and prominently displayed on the packaging:

(a) the maximum output power of the control gear (for HL. LED and OLED) or the power of the light source for which the control gear is intended (for FL and HID);

(b) the type of light source(s) for which it is intended;

(c) the efficiency in full-load. expressed in percentage;

(d) the no-load power (Pno). expressed in W and rounded to the second decimal. or the indication that the gear is not intended to operate in no-load mode. If the value is zero. it may be omitted from the packaging but shall nonetheless be declared in the technical documentation and on websites;

(e) the standby power (Psb). expressed in W and rounded to the second decimal. If the value is zero. it may be omitted from the packaging but shall nonetheless be declared in the technical documentation and on websites;

(f) where applicable. the networked standby power (Pnet). expressed in W and rounded to the second decimal. If the value is zero. it may be omitted from the packaging but shall nonetheless be declared in the technical documentation and on websites;

(g) a warning if the control gear is not suitable for dimming of light sources or can be used only with specific types of dimmable light sources or using specific wired or wireless dimming methods. In the latter cases. detailed information on the conditions in which the control gear can be used for

dimming shall be provided on the manufacturer's or importer's website;

(h) a QR-code redirecting to a free-access website of the manufacturer. importer or authorised representative. or the internet address for such a website. where full information on the control gear can be found.

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

(1) Separate control gears:

For any separate control gear that is placed on the EU market. the following information shall be displayed on at least one free-access website:

(a) the information specified in point 3(b)(2). except 3(b)(2)(h);

(b) the outer dimensions in mm;

(c) the mass in grams of the control gear. without packaging. and without lighting control parts and non-lighting parts. if any and if they can be physically separated from the control gear;

(d) instructions on how to remove lighting control parts and non-lighting parts. if any. or how to switch them off or minimise their power consumption during control-gear testing for market surveillance purposes;

(e) if the control gear can be used with dimmable light sources. a list of minimum characteristics that the light sources should have to be fully compatible with the control gear during dimming. and possibly a list of compatible dimmable light sources;

(f) recommendations on how to dispose of it at the end of its life in line with Directive 2012/19/EU.

The information does not need to use the exact wording in the list above. Alternatively. it may be displayed in the form of graphs. drawings or symbols.

(d) Technical documentation

(1) Separate control gears:

The information specified in point 3(c)(1) of this Annex shall also be contained in the technical documentation file drawn up for the purposes of conformity assessment pursuant to Article 8 of Directive 2009/125/EC.';

(e) Information for products specified in point 3 of Annex III

For the light sources and separate control gears specified in point 3 of Annex III the intended purpose shall be stated in the technical documentation for compliance assessment as per Article 5 of this Regulation and on all forms of packaging. product information and advertisement.

together with an explicit indication that the light source or separate control gear is not intended for use in other applications.

The technical documentation file drawn up for the purposes of conformity assessment. in accordance with Article 5 of this Regulation shall list the technical parameters that make the product design specific to qualify for the exemption.

In particular for light sources indicated in point 3(p) of Annex III it shall be stated: 'This light source is only for use by photo sensitive patients. Use of this light source will lead to increased energy cost compared to an equivalent more energy efficient product.'

Article 4 Removal of light sources and separate control gears

1. Manufacturers. importers or authorised representatives of containing products shall ensure that light sources and separate control gears can be replaced with the use of common available tools and without permanent damage to the containing product. unless a technical justification related to the functionality of the containing product is provided in the technical documentation explaining why the replacement of light sources and separate control gear is not appropriate.

   The technical documentation shall also provide instructions on how light sources and separate control gears can be removed without being permanently damaged for verification purposes by market surveillance authorities.

2. Manufacturers. importers or authorised representatives of containing products shall provide information about the replaceability or non-replaceability of light sources and control gears by end-users or qualified persons without permanent damage to the containing product. Such information shall be available on a free-access website. For products sold directly to end-users. this information shall be on the packaging. at least in the form of a pictogram. and in the user instructions.

3. Manufacturers. importers or authorised representatives of containing products shall ensure that light sources and separate control gears can be dismantled from containing products at end of life. Dismantling instructions shall be available on a free access website.

COMMISSION DELEGATED REGULATION (EU) 2019/2015:

ANNEX V: Product information

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 Table 3. including when the light source is a part in a containing product. Details see table 3: Product information sheet.

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 (1).

4. Information for products specified in point 3 of Annex IV

For the light sources specified in point 3 of Annex IV. their intended use shall be stated on all forms of packaging. product information and advertisement. together with a clear indication that the light source is not intended for use in other applications.

The technical documentation file drawn up for the purposes of conformity assessment. in accordance with paragraph 3 of Article 3 of Regulation (EU) 2017/1369 shall list the technical parameters that make the product design specific to qualify for the exemption.

Appendix III: Measuring Instruments and Test Equipments

No.	Series No.	Name	Model
1	--	Opto-color-measurmentsyetem	YF1000
2	M133806CD1401170	Standard light source	M133800
3	M112048CJ1351153	High Accuracy Array Spectroradio meter	HAAS-2000
4	1655281	Temp. & Humidity recorder	7210-00
5	F155300002	integrating sphere	2m
6	P1860CJ1391124	DF tester	PF310A
7	P1860CJ1391124	Power Source	PF310A
8	YQ-JC-1401A	Lighting stand	1401A
9	P1860CJ1391124	Digital power meter	PF310A
Remark: all test equipments calibration was valid during testing.			

Appendix IV: Photo of tested samples:



MK-020011003398—F

Appendix V: Product information sheet:

Supplier's name or trade mark		Zhejiang Meka Optoelectronic Co., Ltd		
Supplier's address		NO.8 Canghai Road, Lihai Town, Binhai New City, Shaoxing 312300 zhejiang Province P.R. China		
Model identifier		**MK-020011003398—F**		
Type of light source:		--		
Lighting technology used:		LED	Non-directional or directional:	NDLS
Light source cap-type (or other electric interface)		G13		
Mains or non-mains:		MLS	Connected light source (CLS):	No
Colour-tuneable light source:		No	Envelope:	No
High luminance light source:		No	--	--
Anti-glare shield:		No	Dimmable:	No
Product parameters				
Parameter		Value	Parameter	Value
Energy consumption in on-mode (kWh/1 000 h). **rounded up to the nearest integer**		9	Energy efficiency class	F
Useful luminous flux (Φuse). indicating if it refers to the flux in a sphere (360°). in a wide cone (120°) or in a narrow cone (90°)		360° in a sphere	Correlated colour temperature. rounded to the nearest 100 K. or the range of correlated colour temperatures. rounded to the nearest 100 K. that can be set	6500K
On-mode power (Pon). expressed in W		9	Standby power (Psb). expressed in W and rounded to the second decimal	--
Networked standby power (Pnet) for CLS. expressed in W and rounded to the second decimal		--	Colour rendering index. rounded to the nearest integer. or the range of CRI-values that can be set	80
Outer dimensions (a). (e) without separate control gear. lighting control parts and non-lighting control parts. if any (millimetre)	Height	604mm	Spectral power distribution in the range 250 nm to 800 nm. at full-load	See "Table 6: Spectrum"
	Width	28mm		
	Depth	28mm		

Claim of equivalent power	--	If yes. equivalent power (W)	--
--	--	Chromaticity coordinates (x and y)	x=0.313. y=0.337 (F6500K)
Parameters for directional light sources:			
Peak luminous intensity (cd)	--	Beam angle in degrees. or the range of beam angles that can be set	--
Parameters for LED and OLED light sources:			
R9 colour rendering index value	--	Survival factor	≥90%
the lumen maintenance factor	95.81%	--	--
Parameters for LED and OLED mains light sources:			
displacement factor (cos φ1)	≥0.5	Colour consistency in McAdam ellipses	≤6
Claims that an LED light source replaces a fluorescent light source without integrated ballast of a particular wattage.	--	If yes then replacement claim (W)	--
Flicker metric (Pst LM)	≤1.0	Stroboscopic effect metric (SVM)	≤0.4

--END--