

Prüfbericht-Nr.: Test Report No.:	60397537 001	Auftrags-Nr.: Order No.:	244343245	Seite 1 von 26 Page 1 of 26
Kunden-Referenz-Nr.: Client Reference No.:	2157271	Auftragsdatum: Order date:	2021.07.01	
Auftraggeber: Client:	ANHUI SHILIN LIGHTING CO., LTD. ECONOMIC DEVELOPMENT ZONE, HUOSHAN, LU'AN, Anhui, P.R. China			
Prüfgegenstand: Test item:	Self-ballasted LED lamps			
Bezeichnung / Typ-Nr.: Identification / Type No.:	SL-F-S4-A, SL-F-S6-A, SL-F-S8-A			
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 receipt:	2021.01.15			
Prüfmuster-Nr.: Test sample No.:	Number 1# to 10# for each model			
Prüfzeitraum: Testing period:	2021.01.15 - 2021.06.18			
Ort der Prüfung: Place of testing:	ANHUI SHILIN LIGHTING CO., LTD.			
Prüflaboratorium: Testing laboratory:	TÜV Rheinland (Shanghai) Co., Ltd.			
Prüfergebnis*: Test result*:	Siehe Sonstiges / See Other aspects			
geprüft von: tested by:	Fernando Dai	genehmigt von: authorized by:	Alex Yan	
Datum: 2021.07.01	<i>Fernando Dai</i>	Datum: 2021.07.01	<i>Alex Yan</i>	
Stellung / Position:	PE	Stellung / Position:	Reviewer	
Sonstiges / Other :	This testing report is according to the ecodesign requirements for Light source. this report, 3600h test result was measured. Energy efficiency class according to COMMISSION DELEGATED REGULATION (EU) 2019/2015 is also considered, and the result is for reference. Appendix: Photo of tested samples.			
Zustand des Prüfgegenstandes bei Anlieferung: Condition of the test item at delivery:	Prüfmuster vollständig und unbeschädigt Test item complete and undamaged			
* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	4 = ausreichend N/A = nicht anwendbar
Legend:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good F(ail) = failed a.m. test specification(s)	3 = satisfactory F(ail) = failed a.m. test specification(s)	4 = sufficient N/A = not applicable
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. <i>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.</i>				

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..... Self-ballasted LED lamps

Model name See model list

Trade Mark 

Manufacturer **ANHUI SHILIN LIGHTING CO., LTD.**

address..... ECONOMIC DEVELOPMENT ZONE, HUOSHAN, LU'AN, Anhui,
P.R. China

Factory **ANHUI SHILIN LIGHTING CO., LTD.**

address..... ECONOMIC DEVELOPMENT ZONE, HUOSHAN, LU'AN, Anhui,
P.R. China

Declare value description:

Rated input.....: 220-240V~,50/60Hz

Rated wattage: See model list of light source

Nominal luminous flux Φ: See model list of light source

Declared η_{TM} : 100,0lm/W

Declared Colour rendering (CRI).....: ≥ 80

Declared Displacement factor for LED and
OLED MLS (DF): $\geq 0,9$

Declared Lumen maintenance factor for
LED and OLED.....: 0,96

Declared Survival factor for LED and OLED: 0,90

Declared colour consistency for LED and
OLED: < 6

Declared beam angle for DLS: N/A

Declared lamp life: 25000h

Declared color temperature: 2200K (x: 0,5004, y: 0,4152)

Declared Flicker for LED and OLED MLS ...: $\leq 1,0$

Declared Stroboscopic effect for LED and
OLED MLS.....: $\leq 0,4$

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. 2.0

- TRF Originator TÜV Rheinland

- Master TRF Dated 2021-03

General product information:**Light source:**

Type	Rated wattage	Lamp cap	Ponmax	Nominal luminous flux Φ	Declared color temperature	Declared η_{TM}	Declare Energy efficiency class	Energy consumption
SL-F-S4-A	4W	E27	5,22W	400lm	2200K	100,0lm/W	F	4kWh/1000h
SL-F-S6-A	6W	E27	7,02W	600lm	2200K	100,0lm/W	F	6kWh/1000h
SL-F-S8-A	8W	E27	8,82W	800lm	2200K	100,0lm/W	F	8kWh/1000h

Summary of testing:

Type	Testing condition	Testing period
SL-F-S4-A	230VAC, 50Hz	2021.01.15-2021.06.18
SL-F-S6-A	230VAC, 50Hz	2021.01.15-2021.06.18
SL-F-S8-A	230VAC, 50Hz	2021.01.15-2021.06.18

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 P_{on} shall not exceed the maximum allowed power P_{onmax} (in W), defined as a function of the declared useful luminous flux Φ_{use} (in lm) and the declared colour rendering index CRI (-) as follows: $P_{onmax} = C_x(L + \Phi_{use}/(F \times \eta)) \times R$		☒ P ☐ F ☐ N/A ☐ Under testing
	The standby power P_{sb} of a light source shall not exceed 0,5W.		☐ P ☐ F ☒ N/A ☐ Under testing
	The networked standby power P_{net} of a connected light source shall not exceed 0,5W. The allowable values for P_{sb} and P_{net} 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 P_{no} of a separate control gear shall not exceed 0,5W. 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 P_{sb} of a separate control gear shall not exceed 0,5W.		☐ P ☐ F ☒ N/A ☐ Under testing
	The networked standby power P_{net} of a connected separate control gear shall not exceed 0,5W. The allowable values for P_{sb} and P_{net} 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 $\Phi_{use} > 4klm$ 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)	See table 1	☒ P ☐ F ☐ N/A ☐ Under testing
Displacement factor (DF, $\cos \phi_1$) at power input P_{on} for LED and OLED MLS	No limit at $P_{on} \leq 5W$, DF $\geq 0,5$ at $5 W < P_{on} \leq 10W$, DF $\geq 0,7$ at $10 W < P_{on} \leq 25W$ DF $\geq 0,9$ at $25 W < P_{on}$	See table 1	☒ 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: $XLMF,MIN\% = 100 \times e^{(3000 \times \ln(0,7)) L70}$ 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	See table 4	☒ 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.	See table 4	☒ 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.	See table 1	☒ P ☐ F ☐ N/A ☐ Under testing
Flicker for LED and OLED MLS	$P_{st} LM \leq 1,0$ at full-load	See table 1	☒ P ☐ F ☐ N/A ☐ Under testing

Stroboscopic effect for LED and OLED MLS	SVM ≤ 0,9 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); 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)'	See table 1	☒ P ☐ 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

Table 1: Initial test results:SL-F-S4-A							
Sample No.	Measured voltage (V)	Measured current (mA)	Measured power(W)	Initial Φ_{use} (lm)	CCT. (K)	Beam angle (°)	
1#	230,0	33,0	4,10	452,8	2222	--	
2#	230,0	34,0	4,00	442,9	2224	--	
3#	230,0	34,0	4,00	443,3	2212	--	
4#	230,0	33,0	4,10	443,4	2204	--	
5#	230,0	34,0	4,00	443,8	2211	--	
6#	230,0	33,0	4,10	452,8	2222	--	
7#	230,0	34,0	4,00	442,9	2218	--	
8#	230,0	34,0	4,00	443,3	2210	--	
9#	230,0	34,0	4,00	438,2	2207	--	
10#	230,0	34,0	4,10	433,5	2225	--	
Average	230,0	33,7	4,04	443,7	2216	--	
Sample No.	Colour rendering (CRI)	Displacement factor (DF)	Colour consistency	Flicker (Pst LM)	Stroboscopic effect (SVM)	Psb (W)	Pnet (W)
1#	82,9	--	2,3	0,370	0,019	--	--
2#	82,8	--	2,2	0,360	0,018	--	--
3#	82,8	--	2,8	0,350	0,020	--	--
4#	82,7	--	3,2	0,360	0,020	--	--
5#	82,9	--	3,0	0,370	0,019	--	--
6#	84,0	--	3,6	0,370	0,019	--	--
7#	83,0	--	2,5	0,370	0,019	--	--
8#	83,2	--	3,3	0,380	0,020	--	--
9#	83,2	--	3,7	0,360	0,020	--	--
10#	83,3	--	3,0	0,370	0,018	--	--
Average	83,1	--	3,0	0,366	0,019	--	--
Required	≥80	--	≤6	≤1,0	≤0,9	<0,5W	<0,5W

Table 2: Initial test results:SL-F-S4-A							
Sample No.	Initial Φ_{use} (lm)	Efficacy factor (F)	CRI factor (R)	Threshold efficacy (η)	End loss factor (L)	Correction factor (C)	Ponmax
1#	452,8	1,00	1,02	120	1,5	1,08	5,81
2#	442,9	1,00	1,02	120	1,5	1,08	5,72
3#	443,3	1,00	1,02	120	1,5	1,08	5,72
4#	443,4	1,00	1,02	120	1,5	1,08	5,72
5#	443,8	1,00	1,02	120	1,5	1,08	5,73
6#	452,8	1,00	1,03	120	1,5	1,08	5,87
7#	442,9	1,00	1,02	120	1,5	1,08	5,72
8#	443,3	1,00	1,02	120	1,5	1,08	5,72
9#	438,2	1,00	1,02	120	1,5	1,08	5,68
10#	433,5	1,00	1,02	120	1,5	1,08	5,63
Average	443,7	1,00	1,02	120	1,5	1,08	5,73
Factor	N/A	☒ 1.00 for NDLS ☐ 0.85 for DLS	☐ 0.65 for CRI $\leq$ 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	$Pon = Cx(L + \Phi_{use}/(Fx \eta) \times R$

Table 3: Initial test results for Energy efficiency classes:SL-F-S4-A						
Sample No.	Initial Φ_{use} (lm)	Initial $P_{on}(W)$	F_{TM}	η_{TM} (lm/W)	Test Energy efficiency class	Declare Energy efficiency class
1#	452,8	4,10	1,000	110,4	E	F
2#	442,9	4,00	1,000	110,7	E	F
3#	443,3	4,00	1,000	110,8	E	F
4#	443,4	4,10	1,000	108,1	F	F
5#	443,8	4,00	1,000	111,0	E	F
6#	452,8	4,10	1,000	110,4	E	F
7#	442,9	4,00	1,000	110,7	E	F
8#	443,3	4,00	1,000	110,8	E	F
9#	438,2	4,00	1,000	109,6	F	F
10#	433,5	4,10	1,000	105,7	F	F
Average	443,7	4,04	1,000	109,8	F	F
Energy efficiency class: A: $210 \leq \eta_{TM}$ B: $185 \leq \eta_{TM} < 210$ C: $160 \leq \eta_{TM} < 185$ D: $135 \leq \eta_{TM} < 160$ E: $110 \leq \eta_{TM} < 135$ F: $85 \leq \eta_{TM} < 110$ G: $\eta_{TM} < 85$				Factors F_{TM} by light source type: ☒ NDLS & MLS: 1.000 ☐ NDLS & NMLS: 0.926 ☐ DLS & MLS: 1.176 ☐ DLS & NMLS: 1.089		

Table 4: Test results of survival factor and Lumen maintenance:SL-F-S4-A				
Sample No.	Initial Φ use (lm)	3600H Φ use (lm)	XL MF, MIN% at 3600H	survival factor at 3600H
1#	452,8	438,7	96,89%	Survival
2#	442,9	427,7	96,57%	Survival
3#	443,3	429,0	96,77%	Survival
4#	443,4	428,2	96,57%	Survival
5#	443,8	427,6	96,35%	Survival
6#	452,8	435,6	96,20%	Survival
7#	442,9	430,7	97,25%	Survival
8#	443,3	426,5	96,21%	Survival
9#	438,2	421,5	96,19%	Survival
10#	433,5	420,6	97,02%	Survival
Average	443,7	428,6	96,60%	--
Required	--	--	95,81%	90,00%

Appendix I: Test results

Table 1: Initial test results:SL-F-S6-A							
Sample No.	Measured voltage (V)	Measured current (mA)	Measured power(W)	Initial Φ_{use} (lm)	CCT. (K)	Beam angle (°)	
1#	230,0	36,0	6,10	588,0	2249	--	
2#	230,0	37,0	6,20	602,0	2261	--	
3#	230,0	37,0	6,20	605,0	2263	--	
4#	230,0	36,0	6,00	585,0	2254	--	
5#	230,0	37,0	6,10	589,0	2261	--	
6#	230,0	36,0	6,10	588,0	2249	--	
7#	230,0	36,0	6,00	583,0	2245	--	
8#	230,0	36,0	6,10	581,0	2240	--	
9#	230,0	37,0	6,10	591,0	2260	--	
10#	230,0	37,0	6,00	573,0	2265	--	
Average	230,0	36,5	6,09	588,5	2255	--	
Sample No.	Colour rendering (CRI)	Displacement factor (DF)	Colour consistency	Flicker (Pst LM)	Stroboscopic effect (SVM)	Psb (W)	Pnet (W)
1#	82,3	0,988	0,4	0,103	0,006	--	--
2#	82,5	0,990	0,5	0,102	0,005	--	--
3#	82,5	0,990	0,6	0,102	0,005	--	--
4#	82,5	0,989	0,2	0,103	0,006	--	--
5#	82,5	0,990	0,5	0,103	0,005	--	--
6#	82,3	0,981	0,5	0,102	0,005	--	--
7#	82,2	0,984	0,8	0,101	0,006	--	--
8#	82,5	0,981	0,9	0,102	0,005	--	--
9#	82,1	0,984	0,4	0,102	0,005	--	--
10#	83,6	0,990	1,0	0,103	0,006	--	--
Average	82,5	0,987	0,6	0,102	0,005	--	--
Required	≥80	≥0,5	≤6	≤1,0	≤0,9	<0,5W	<0,5W

Table 2: Initial test results:SL-F-S6-A							
Sample No.	Initial Φ_{use} (lm)	Efficacy factor (F)	CRI factor (R)	Threshold efficacy (η)	End loss factor (L)	Correction factor (C)	Ponmax
1#	588,0	1,00	1,01	120	1,5	1,08	6,98
2#	602,0	1,00	1,02	120	1,5	1,08	7,18
3#	605,0	1,00	1,02	120	1,5	1,08	7,21
4#	585,0	1,00	1,02	120	1,5	1,08	7,02
5#	589,0	1,00	1,02	120	1,5	1,08	7,06
6#	588,0	1,00	1,01	120	1,5	1,08	6,98
7#	583,0	1,00	1,01	120	1,5	1,08	6,94
8#	581,0	1,00	1,02	120	1,5	1,08	6,99
9#	591,0	1,00	1,01	120	1,5	1,08	7,01
10#	573,0	1,00	1,02	120	1,5	1,08	6,91
Average	588,5	1,00	1,02	120	1,5	1,08	7,05
Factor	N/A	☒ 1.00 for NDLS ☐ 0.85 for DLS	☐ 0.65 for CRI $\leq$ 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	$Pon = Cx(L + \Phi_{use}/(Fx \eta)) \times R$

Table 3: Initial test results for Energy efficiency classes:SL-F-S6-A						
Sample No.	Initial Φ_{use} (lm)	Initial $P_{on}(W)$	F_{TM}	η_{TM} (lm/W)	Test Energy efficiency class	Declare Energy efficiency class
1#	588,0	6,10	1,000	96,4	F	F
2#	602,0	6,20	1,000	97,1	F	F
3#	605,0	6,20	1,000	97,6	F	F
4#	585,0	6,00	1,000	97,5	F	F
5#	589,0	6,10	1,000	96,6	F	F
6#	588,0	6,10	1,000	96,4	F	F
7#	583,0	6,00	1,000	97,2	F	F
8#	581,0	6,10	1,000	95,2	F	F
9#	591,0	6,10	1,000	96,9	F	F
10#	573,0	6,00	1,000	95,5	F	F
Average	588,5	6,09	1,000	96,6	F	F
Energy efficiency class: A: $210 \leq \eta_{TM}$ B: $185 \leq \eta_{TM} < 210$ C: $160 \leq \eta_{TM} < 185$ D: $135 \leq \eta_{TM} < 160$ E: $110 \leq \eta_{TM} < 135$ F: $85 \leq \eta_{TM} < 110$ G: $\eta_{TM} < 85$				Factors F_{TM} by light source type: ☒ NDLS & MLS: 1.000 ☐ NDLS & NMLS: 0.926 ☐ DLS & MLS: 1.176 ☐ DLS & NMLS: 1.089		

Table 4: Test results of survival factor and Lumen maintenance:SL-F-S6-A				
Sample No.	Initial Φ use (lm)	3600H Φ use (lm)	XL MF, MIN% at 3600H	survival factor at 3600H
1#	588,0	572,5	97,36%	Survival
2#	602,0	578,3	96,06%	Survival
3#	605,0	581,4	96,10%	Survival
4#	585,0	567,0	96,92%	Survival
5#	589,0	571,9	97,10%	Survival
6#	588,0	565,7	96,21%	Survival
7#	583,0	561,1	96,24%	Survival
8#	581,0	558,9	96,20%	Survival
9#	591,0	568,5	96,19%	Survival
10#	573,0	556,7	97,16%	Survival
Average	588,5	568,2	96,55%	--
Required	--	--	95,81%	90,00%

Appendix I: Test results

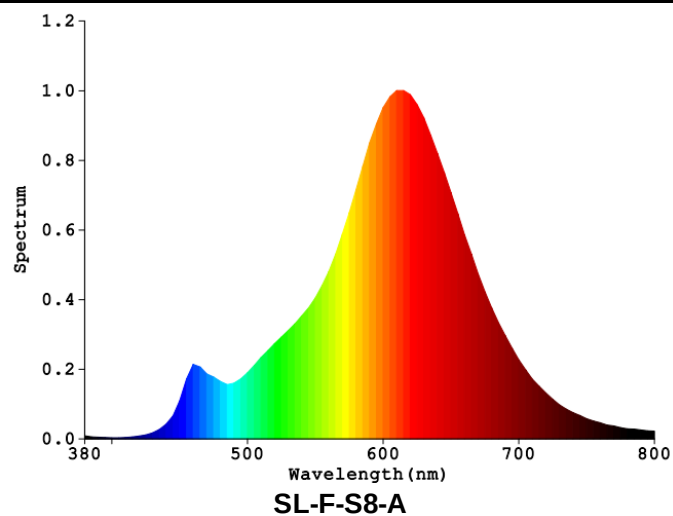
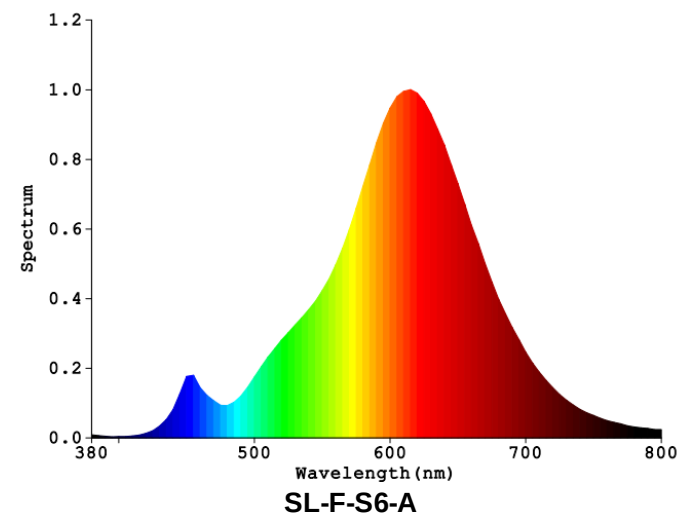
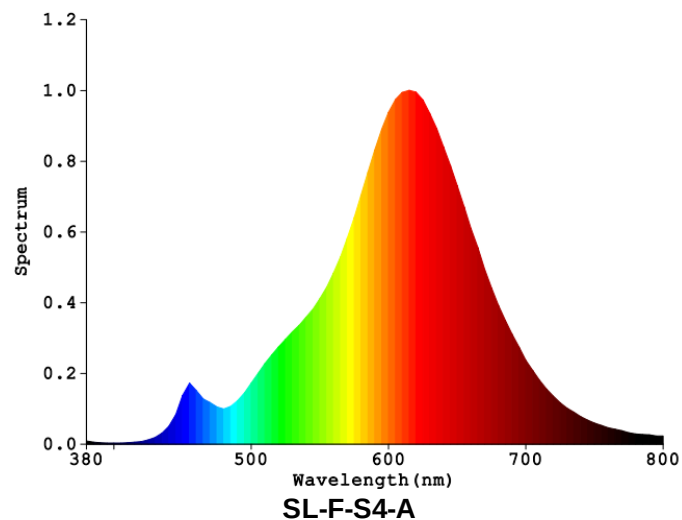
Table 1: Initial test results:SL-F-S8-A							
Sample No.	Measured voltage (V)	Measured current (mA)	Measured power(W)	Initial Φ use (lm)	CCT. (K)	Beam angle (°)	
1#	230,0	43,0	7,50	742,0	2257	--	
2#	230,0	42,0	7,40	732,0	2268	--	
3#	230,0	42,0	7,40	728,0	2261	--	
4#	230,0	43,0	7,50	753,0	2257	--	
5#	230,0	43,0	7,50	748,0	2260	--	
6#	230,0	43,0	7,50	742,0	2257	--	
7#	230,0	42,0	7,50	741,0	2262	--	
8#	230,0	43,0	7,40	753,0	2253	--	
9#	230,0	42,0	7,50	733,0	2255	--	
10#	230,0	43,0	7,40	748,0	2245	--	
Average	230,0	42,6	7,46	742,0	2258	--	
Sample No.	Colour rendering (CRI)	Displacement factor (DF)	Colour consistency	Flicker (Pst LM)	Stroboscopic effect (SVM)	Psb (W)	Pnet (W)
1#	82,5	0,981	1,0	0,180	0,051	--	--
2#	82,4	0,984	1,1	0,180	0,053	--	--
3#	82,4	0,982	1,2	0,200	0,051	--	--
4#	82,4	0,990	1,0	0,190	0,052	--	--
5#	82,4	0,983	1,1	0,190	0,053	--	--
6#	82,5	0,990	1,0	0,180	0,051	--	--
7#	82,4	0,988	1,3	0,180	0,052	--	--
8#	82,5	0,986	1,7	0,190	0,053	--	--
9#	82,8	0,990	1,9	0,180	0,051	--	--
10#	82,1	0,988	1,3	0,200	0,055	--	--
Average	82,4	0,986	1,3	0,187	0,052	--	--
Required	≥80	≥0,5	≤6	≤1,0	≤0,9	<0,5W	<0,5W

Table 2: Initial test results:SL-F-S8-A							
Sample No.	Initial Φ_{use} (lm)	Efficacy factor (F)	CRI factor (R)	Threshold efficacy (η)	End loss factor (L)	Correction factor (C)	Ponmax
1#	742,0	1,00	1,02	120	1,5	1,08	8,46
2#	732,0	1,00	1,02	120	1,5	1,08	8,37
3#	728,0	1,00	1,02	120	1,5	1,08	8,34
4#	753,0	1,00	1,02	120	1,5	1,08	8,56
5#	748,0	1,00	1,02	120	1,5	1,08	8,52
6#	742,0	1,00	1,02	120	1,5	1,08	8,46
7#	741,0	1,00	1,02	120	1,5	1,08	8,45
8#	753,0	1,00	1,02	120	1,5	1,08	8,56
9#	733,0	1,00	1,02	120	1,5	1,08	8,38
10#	748,0	1,00	1,01	120	1,5	1,08	8,44
Average	742,0	1,00	1,02	120	1,5	1,08	8,46
Factor	N/A	☒ 1.00 for NDLS ☐ 0.85 for DLS	☐ 0.65 for CRI $\leq$ 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	$P_{on} = C_x(L + \Phi_{use}/(F \times \eta) \times R$

Table 3: Initial test results for Energy efficiency classes:SL-F-S8-A						
Sample No.	Initial Φ_{use} (lm)	Initial $P_{on}(W)$	F_{TM}	η_{TM} (lm/W)	Test Energy efficiency class	Declare Energy efficiency class
1#	742,0	7,50	1,000	98,9	F	F
2#	732,0	7,40	1,000	98,9	F	F
3#	728,0	7,40	1,000	98,4	F	F
4#	753,0	7,50	1,000	100,4	F	F
5#	748,0	7,50	1,000	99,7	F	F
6#	742,0	7,50	1,000	98,9	F	F
7#	741,0	7,50	1,000	98,8	F	F
8#	753,0	7,40	1,000	101,8	F	F
9#	733,0	7,50	1,000	97,7	F	F
10#	748,0	7,40	1,000	101,1	F	F
Average	742,0	7,46	1,000	99,5	F	F
Energy efficiency class: A: $210 \leq \eta_{TM}$ B: $185 \leq \eta_{TM} < 210$ C: $160 \leq \eta_{TM} < 185$ D: $135 \leq \eta_{TM} < 160$ E: $110 \leq \eta_{TM} < 135$ F: $85 \leq \eta_{TM} < 110$ G: $\eta_{TM} < 85$				Factors FTM by light source type: ☒ NDLS & MLS: 1.000 ☐ NDLS & NMLS: 0.926 ☐ DLS & MLS: 1.176 ☐ DLS & NMLS: 1.089		

Table 4: Test results of survival factor and Lumen maintenance:SL-F-S8-A				
Sample No.	Initial Φ use (lm)	3600H Φ use (lm)	XL MF, MIN% at 3600H	survival factor at 3600H
1#	742,0	715,3	96,40%	Survival
2#	732,0	705,0	96,31%	Survival
3#	728,0	708,6	97,34%	Survival
4#	753,0	726,1	96,43%	Survival
5#	748,0	721,8	96,50%	Survival
6#	742,0	719,8	97,01%	Survival
7#	741,0	716,6	96,71%	Survival
8#	753,0	724,4	96,20%	Survival
9#	733,0	712,1	97,15%	Survival
10#	748,0	718,8	96,10%	Survival
Average	742,0	716,9	96,61%	--
Required	--	--	95,81%	90,00%

Table 5: Spectrum



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 (Φ_{use}) 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 L70B50 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. 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 $T_a \neq 25^\circ\text{C}$ 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 (P_{no}), 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 (P_{sb}), 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 (P_{net}), 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;
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;
 - (d) 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;
 - (e) 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 II: Photo of tested samples:

	Overview of SL-F-S4-A
	Overview of SL-F-S6-A

	Overview of SL-F-S8-A

-- End of report --