Test Report issued under the responsibility of:

TEST REPORT **COMMISSION REGULATION (EU) No 1194/2012 of 12 December 2012** **COMMISSION DELEGATED REGULATION (EU) No 874/2012 of 26 September 2012** **Implementing Directive 2009/125/EC Of The European Parliament And Of The Council With Regard To Ecodesign Requirements For Directional Lamps, Light Emitting Diode Lamps And Related Equipment**	
Report reference No. ..... :	AOC250516021ER
Tested by ..... :	Bill Hu
Approved by ..... :	Robin Liu
Date of issue ..... :	2025-05-28
Contents ..... :	20 pages
Testing laboratory	
Name ..... :	Shenzhen AOCE Electronic Technology Service Co., Ltd
Address ..... :	Room 202, 2nd Floor, No.12th Building of Xinhe Tongfuyu Industrial Park, Fuhai Street, Baoan District, Shenzhen, Guangdong, China
Testing location ..... :	As above
Client	
Name ..... :	JORDAN ZARA FOR ELECTRICAL TOOLS & MANUFACTURING CO., LTD.
Address..... :	JABAL AL-HUSSEIN-AS'AD KALIL ST., AMMAN, JORDAN.
Manufacturer	
Name ..... :	JORDAN ZARA FOR ELECTRICAL TOOLS & MANUFACTURING CO., LTD.
Address..... :	JABAL AL-HUSSEIN-AS'AD KALIL ST., AMMAN, JORDAN.
Test specification	
Standard ..... :	COMMISSION REGULATION (EU) No 1194/2012 of 12 December 2012; COMMISSION DELEGATED REGULATION (EU) No 874/2012 of 26 September 2012
Test procedure ..... :	COMMISSION REGULATION (EU) No 1194/2012 of 12 December 2012; COMMISSION DELEGATED REGULATION (EU) No 874/2012 of 26 September 2012
Non-standard test method ..... :	N/A
Test item Description ..... :	LED FLOOD LIGHT
Trademark ..... :	Riovance, LAVA, Golden Zara, Jordan Zara, Trm, Rioled
Model and/or type reference..... :	MH-FDFX-100W
Rating(s)(V/Hz) ..... :	220-240V~, 50/60Hz, 100W
Test Report Form No. ..... :	TRF No. 1194/2012
Test Report Form(s) Originator ..... :	AOCE
Master TRF..... :	2019-11-30

Test case verdicts	
Test case does not apply to the test object :	N(N/A)
Test item does meet the requirement .....:	P(Pass)
Test item does not meet the requirement ...:	F(Fail)
Testing	
Date of receipt of test item ..... :	2024-07-25
Date(s) of performance of test.....:	2024-07-25 to 2025-05-16
Test item particulars:	
Lamp type:	
- Non directional LED lamp	No
- Directional LED lamp	Yes
- LED lamp replacing fluorescent lamp without integrated ballast	No
Control gear:	
- Integrated	Yes
- External	No
Use of lamp:	
- Indoor	No
- Outdoor	Yes
- Industry	No
Envelope transparency:	
- Clear lamp	No
- Non-clear lamp	Yes
Dimmable lamp:	No
Lamps with anti-glare shield:	No
Lamp cap installed:	N/A
Declared data:	
Rated voltage ……..…...…(V):	220-240 V~
Rated lamp power ……..……(W):	100 W
Rated useful luminous flux……(lm):	11200 lm
Rated beam angel ……..... (°):	N/A
Rated Ra ……..……..……..:	80
Rated CCT ……..……..…..(K):	7000K
Rated life time ……..…..(h):	30000 h
LED information	

Summary of testing:
The product meets the efficiency requirement of stage 1 to stage 3 of directional lamps according to the implementation measure No. EU 1194/2012.
The product meets the functionality requirements of stage 3 according to the implementation measure No. EU 1194/2012.
Remark:
Lamp survival factor at 6000 h and lumen maintenance at 6000 h will be applicable from 1 March 2014.
Efficiency & Information requirement:

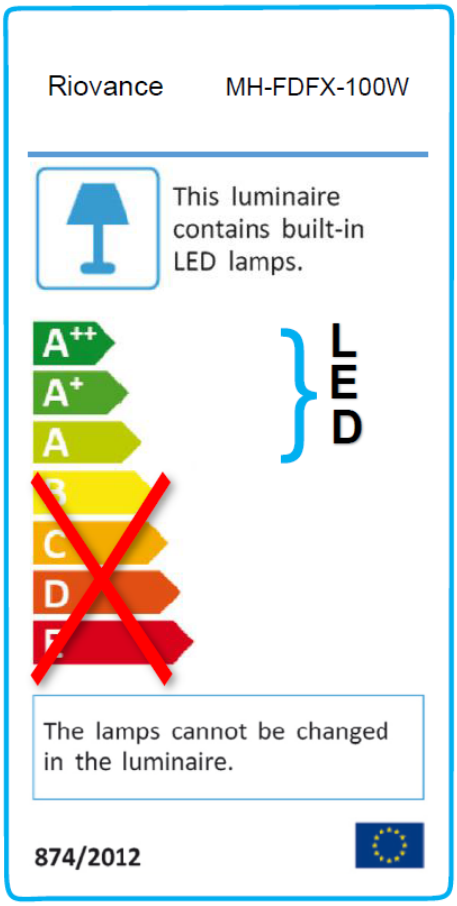
Non-directional	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
Start Date	1.Sep.2009	1.Sep.2009	1.Sep.2011	1.Sep.2012	1.Sep.2013	1.Sep.2016

directional	Stage 1	Stage 2	Stage 3
Start Date	1.Sep.2013	1.Sep.2014	1.Sep.2016

Functionality requirement:

All	Stage 1	Stage 1a	Stage 2	Stage 3
Start Date	1.Sep.2013	1.Mar.2014	1.Sep.2014	1.Sep.2016

Copy of marking plate



General remarks

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.
Throughout this report a comma (point) is used as the decimal separator.

Summary of testing

The sample(s) tested complies with the requirements of COMMISSION REGULATION (EC) No 1194/2012.

These tests fulfil the requirements of standard ISO/IEC 17025.

When determining the test conclusion, the Measurement Uncertainty of test has been considered.

Measurements of power of 0,50 W or greater was made with an uncertainty of less than or equal to 2 % at the 95 % confidence level.

Measurements of power of less than 0,50 W was made with an uncertainty of less than or equal to 0,01 W at the 95 % confidence level.

COMMISSION REGULATION (EU) No 1194/2012 of 12 December 2012			
Clause	Requirement - Test	Result - Remark	Verdict
0	**Measurement methods**		P
	Recognised state of art measurement methods incl. the one published in the Official Journal taking into account the measurement methods of (EC) 244/2009, (EU) 1194/2012		P
1.	Sample		P
	Number of sample used for test ……:		P
2.	Number of sample used for test ……:	20 PCS	P
2.1	**Non-directional LED lamp**		N
a	Non-directional LED lamp		N
	Evaluation : P ≤ Pmax		N
b	Limit definition:		N
	Clear lamps - Stage 1~5: Pmax = 0,8 * (0,88√Φ+0,049Φ)		N
	Clear lamps - Stage 6: Pmax = 0,6 * (0,88√Φ+0,049Φ)		N
	Non-clear lamps - Stage 1~6: Pmax = 0,24√Φ+0,0103Φ		N
c	Exceptions:		N
	Clear lamps 60 lm ≤ Φ ≤ 950 lm in Stage 1 Pmax = 1,1 * (0,88√Φ+0,049Φ)		N
	Clear lamps 60 lm ≤ Φ ≤ 725 lm in Stage 2 Pmax = 1,1 * (0,88√Φ+0,049Φ)		N
	Clear lamps 60 lm ≤ Φ ≤ 450 lm in Stage 3 Pmax = 1,1 * (0,88√Φ+0,049Φ)		N
	Clear lamps with G9 or R7s cap in Stage 6 Pmax = 0,8 * (0,88√Φ+0,049Φ)		N
	Correction factors, which are cumulative where appropriate and also applicable to the products covered by the Exceptions:		N
	non-clear lamp with colour rendering index ≥ 90 and P ≤ 0,5 * (0,88√Φ+0,049Φ)	Pmax/0,85	N
	non-clear lamp with second envelope and P ≤ 0,5* (0,88√Φ+0,049Φ)	Pmax/0,95	N
	LED lamp requiring external power supply	Pmax/1,1	N

2.2	**Directional LED lamp**		P
a.	The maximum EEI (Annex III, cl.1.1 of EU 1194/2012):		P
	The energy efficiency index is calculated as follows and rounded to 2 decimal places: EEI = Pcor/ Pref		P
	For models with Φuse ≥ 1 300 lumen: Pref=0,07341Φuse		P
	Stage 1~2: EEI max ≤ 0.5		N
	Stage 3: EEI max ≤ 0.2		N
b	Correction factors, which are cumulative where appropriate		P

COMMISSION REGULATION (EU) No 1194/2012 of 12 December 2012			
Clause	Requirement - Test	Result - Remark	Verdict
	No correction appropriate : Pcor = Prated lamps)	Prated:99.42W Pcor: 99.42W	P
	Lamps operating on external LED lamp control gear : Pcor = Prated × 1,10	Prated: Pcor:	N
	Lamps with anti-glare shield: Pcor = Prated ×0,80	Prated: Pcor:	N
c	Pref is the reference power obtained from the useful luminous flux of the lamp (Φuse) by the following formula:		P
	For models with Φuse < 1 300 lumen: Pref = 0,88√Φuse+0,049Φuse	Φuse: Pref:	N
	For models with Φuse ≥ 1 300 lumen: Pref = 0,07341 Φuse	Φuse: 11276.6 lm Pref: 827.52	P
2.3	Energy efficiency requirements for lamp control gear(LED driver test with appliance)		N
	Stage 1~2: No-load power ≤ 1.0W		N
	Stage 3: No-load power ≤ 0.5W		N
3	Lamp functionality requirements for non-directional and directional LED lamp (Annex III, cl.2.2, table 5 of EU 1194/2012)		P
3.1	Lamp survival factor (LSF) at 6000h		P
	From March 1, 2014: LSF ≥ 0.90	See the table 5	P
3.2	Lumen maintenance (LLMF) at 6000h		P
	From March 1, 2014: LLMF ≥ 0.80	See the table 5	P
3.3	Number of switching cycles (n) before failure		P
	n ≥ 15 000 if rated lamp life ≥ 30 000 h		P
	otherwise: n ≥ half the rated lamp life expressed in hours	See the table 5	N
3.4	Starting time (tStart)		P
	tStart <0.5 s	See the table 5	P
3.5	Lamp warm-up time (tWarm) to 95 % Φ		P
	tWarm < 2 s	See the table 5	P
3.6	Premature failure rate (PFR)		P
	PFR ≤ 5,0 % at 1000 h	See the table 5	P
3.7	Colour rendering (Ra)		P
	Ra ≥80		N
	Ra ≥65 if the lamp is intended for outdoor or industrial applications	See the table 5	P
3.8	Colour consistency		P
	Variation of chromaticity coordinates within a sixstep MacAdam ellipse or less.	See the table 5	P
3.9	Lamp power factor (PF)		P
	P ≤ 2 W: no requirement		N

COMMISSION REGULATION (EU) No 1194/2012 of 12 December 2012			
Clause	Requirement - Test	Result - Remark	Verdict
	2 W < P ≤ 5 W: PF > 0,4 5 W < P ≤ 25 W: PF > 0,5		N
	P > 25 W: PF > 0,9	See the table 5	P
3.10	Compatibility requirement for lamps using lamp caps also used with filament lamps		N
	Lamps shall comply from **stage 2** with state of art requirements for compatibility with equipment designed for installation between the mains and filament lamps (e.g. dimmer, …)		N
4	Product Information Requirements		N
4.1	Product information requirements for **directional lamps** (Annex III, cl.3.1 of EU 1194/2012)		N
	The following information shall be provided as from stage 1, except where otherwise stipulated.		N
	In all forms of product information, the term **'energy-saving lamp'** or any similar product related promotional statement about lamp efficacy may be used only if the energy efficiency index of the lamp (calculated in accordance with	LED modules marketed as part of a lumiaire from which they are not intended to be removed by the end-user.	N
	the method set out in point 1.1 of this Annex) is 0,40 or below.		N
4.1.1	Information to be displayed on the lamp itself		N
	For lamps other than high-intensity discharge lamps, the value and unit ('lm', 'K' and '°') of the nominal useful luminous flux, of the colour temperature and of the nominal beam angle shall be displayed in a legible font on the surface of the lamp if, after the inclusion of safety-related information such as power and voltage, there is sufficient space available for it on the lamp without unduly obstructing the light coming from the lamp.		N
	If there is room for only one of the three values, the nominal useful luminous flux shall be provided. If there is room for two values, the nominal useful luminous flux and the colour temperature shall be provided.		N
4.1.2	Information to be visibly displayed to end-users, prior to their purchase, on the packaging and on free access websites		N
	The information below shall be displayed on free access websites and in any other form the manufacturer deems appropriate.		N
	If the product is placed on the market in a packaging containing information to be visibly displayed to the end- users, prior to their purchase, the information shall also be clearly and prominently indicated on the packaging.		N

COMMISSION REGULATION (EU) No 1194/2012 of 12 December 2012			
Clause	Requirement - Test	Result - Remark	Verdict
	The information does not need to use the exact wording on the list below. It may be displayed in the form of graphs, drawings or symbols rather than text.		N
(a)	The information does not need to use the exact wording on the list below. It may be displayed in the form of graphs, drawings or symbols rather than text.		N
(b)	Nominal life time of the lamp in hours (not longer than the rated life time);		N
(c)	Colour temperature, as a value in Kelvins and also expressed graphically or in words;		N
(d)	Number of switching cycles before premature failure;		N
(e)	Warm-up time up to 60 % of the full light output (may be indicated as 'instant full light' if less than 1 second);		N
(f)	A warning if the lamp cannot be dimmed or can be dimmed only on specific dimmers; in the latter case a list of compatible dimmers shall be also provided on the manufacturer's website;		N
(g)	If 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;		N
(h)	Lamp dimensions in millimetres (length and largest diameter);		N
(i)	Nominal beam angle in degrees;		N
(j)	If the lamp's beam angle is ≥ 90° and its useful luminous flux as defined in point 1.1 of this Annex is to be measured in a 120° cone, a warning that the lamp is not suitable for accent lighting;		N
(k)	If the lamp cap is a standardised type also used with filament lamps, but the lamp's dimensions are different from the dimensions of the filament lamp(s) that the lamp is meant to replace, a drawing comparing the lamp's dimensions to the dimensions of the filament lamp(s) it replaces;		N
(l)	An indication that the lamp is of a type listed in the first column of Table 6 may be displayed only if the luminous flux of the lamp in a 90° cone (Φ90°) is not lower than the reference luminous flux indicated in Table 6 for the smallest wattage among the lamps of the type concerned. The reference luminous flux shall be multiplied by the correction factor in Table 7. For LED lamps, it shall be in addition multiplied by the correction factor in Table 8;	Claimed equivalent: Refernce Φ90° (lm): (incl. correction factor)	N

COMMISSION REGULATION (EU) No 1194/2012 of 12 December 2012			
Clause	Requirement - Test	Result - Remark	Verdict
(m)	An equivalence claim involving the power of a replaced lamp type may be displayed only if the lamp type is listed in Table 6 and if the luminous flux of the lamp in a 90° cone (Φ90°) is not lower than the corresponding reference luminous flux in Table 6. The reference luminous flux shall be multiplied by the correction factor in Table 7. For LED lamps, it shall be in addition multiplied by the correction factor in Table 8. The intermediate values of both the luminous flux and the claimed equivalent lamp power (rounded to the nearest 1 W) shall be calculated by linear interpolation between the two adjacent values.	Claimed equivalent: Claimed P: Refernce Φ90° (lm): (incl. correction factor)	N

Table 6

Reference luminous flux for equivalence claims

Extra-low voltage reflector type

Type	Power (W)	Reference $\Phi_{90°}$ (lm)
MR11 GU4	20	160
	35	300
MR16 GU 5.3	20	180
	35	300
	50	540
AR111	35	250
	50	390
	75	640
	100	785

Mains-voltage blown glass reflector type

Type	Power (W)	Reference $\Phi_{90°}$ (lm)
R50/NR50	25	90
	40	170
R63/NR63	40	180
	60	300
R80/NR80	60	300
	75	350
	100	580
R95/NR95	75	350
	100	540
R125	100	580
	150	1 000

COMMISSION REGULATION (EU) No 1194/2012 of 12 December 2012			
Clause	Requirement - Test	Result - Remark	Verdict

Mains-voltage pressed glass reflector type

Type	Power (W)	Reference $\Phi_{90°}$ (lm)
PAR16	20	90
	25	125
	35	200
	50	300
PAR20	35	200
	50	300
	75	500
PAR25	50	350
	75	550
PAR30S	50	350
	75	550
	100	750
PAR36	50	350
	75	550
	100	720
PAR38	60	400
	75	555
	80	600
	100	760
	120	900

COMMISSION REGULATION (EU) No 1194/2012 of 12 December 2012			
Clause	Requirement - Test	Result - Remark	Verdict

Table 7

Multiplication factors for lumen maintenance

Lamp type	Luminous flux multiplication factor
Halogen lamps	1
Compact fluorescent lamps	1,08
LED lamps	1 + 0,5 × (1 — *LLMF*) where LLMF is the lumen maintenance factor at the end of the nominal life

Table 8

Multiplication factors for LED lamps

LED lamp beam angle	Luminous flux multiplication factor
20° ≤ beam angle	1
15° ≤ beam angle < 20°	0,9
10° ≤ beam angle < 15°	0,85
beam angle < 10°	0,80

4.1.3	Information to be made publicly available on free-access websites and in any other form the manufacturer deems appropriate		N
(a)	The information specified in above point 4.1.2;		N
(b)	Rated power (0,1 W precision)		N
(c)	Rated useful luminous flux		N
(d)	Rated lamp life time		N
(e)	Lamp power factor		N
(f)	Lumen maintenance factor at the end of the nominal life (except for filament lamps)		N
(g)	Starting time (as X,X seconds)		N
(h)	Colour rendering		N
(i)	Colour consistency (only for LEDs)		N
(j)	Rated peak intensity in candela (cd)		N
(k)	Rated beam angle		N
(l)	If intended for use in outdoor or industrial If intended for use in outdoor or industrial		N
(m)	Spectral power distribution in the range 180-800 nm		N
4.2	Product information requirements for **non-directional lamps** (Annex II, cl.3 of EC 244/2009)		P
	Information to be visibly displayed prior to purchase to end-users on the packaging and on free access websites. (It may be displayed using graphs, figures or symbols rather than text.)		P

COMMISSION REGULATION (EU) No 1194/2012 of 12 December 2012			
Clause	Requirement - Test	Result - Remark	Verdict
(a)	When the nominal lamp power is displayed outside the energy label in accordance with Directive 98/11/EC, the nominal luminous flux of the lamp shall also be separately displayed in a font at least twice as large as the nominal lamp power display outside the label		N
(b)	Nominal life time of the lamp in hours (not higher than the rated life time)		P
(c)	Nominal life time of the lamp in hours (not higher than the rated life time)		N
(d)	Colour temperature (also expressed as a value in Kelvins);		P
(e)	Warm-up time up to 60 % of the full light output (may be indicated as 'instant full light' if less than 1 second);		P
(f)	A warning if the lamp cannot be dimmed or can be dimmed only on specific dimmers;		P
(g)	If designed for optimal use in non-standard conditions (such as ambient temperature Ta ≠ 25 °C), information on those conditions;		N
(h)	Lamp dimensions in millimeters (length and diameter);		P
(i)	If equivalence with an incandescent lamp is claimed on the packaging, the claimed equivalent incandescent lamp power (rounded to 1 W) shall be that corresponding in Table 6 to the luminous flux of the lamp contained in the packaging. The intermediate values of both the luminous flux and the claimed incandescent lamp power (rounded to 1W)shall be calculated by linear interpolation between the two adjacent values.		N

COMMISSION REGULATION (EU) No 1194/2012 of 12 December 2012			
Clause	Requirement - Test	Result - Remark	Verdict

Table 6

Rated lamp luminous flux Φ [lm]			Claimed equivalent incandescent lamp power
CFL	Halogen	LED and other lamps	[W]
125	119	136	15
229	217	249	25
432	410	470	40
741	702	806	60
970	920	1 055	75
1 398	1 326	1 521	100
2 253	2 137	2 452	150
3 172	3 009	3 452	200

(j)	The term **'energy saving lamp'** or any similar product related promotional statement about lamp efficacy may only be used if the lamp complies with the efficacy requirements applicable to non clear lamps in Stage 1 according to Tables 1, 2 and 3.		N
4.2.2	Information to be made publicly available on free-access websites. (information shall be expressed at least as values.)		P
(a)	The information specified in above point 4.2.1		P
(b)	Rated wattage (0,1 W precision);		P
(c)	Rated luminous flux;		P
(d)	Rated lamp life time;		P
(e)	Lamp power factor;		N
(f)	Lumen maintenance factor at the end of the nominal life;		P
(g)	Starting time (as X,X seconds);		P
(h)	Colour rendering.		P
4.3	Additional product information requirements for **LED lamps replacing fluorescent lamps without integrated ballast** (Annex III, cl.3.2 of EU 1194/2012)		N
4.3.1	In addition to the product information requirements according to point 3.1 of this Annex or point 3.1 of Annex II to Regulation (EC) No 244/2009, as from stage 1, manufacturers of		N

COMMISSION REGULATION (EU) No 1194/2012 of 12 December 2012			
Clause	Requirement - Test	Result - Remark	Verdict
	LED lamps replacing fluorescent lamps without integrated ballast shall publish a warning on publicly available free-access websites and in any other form they deem appropriate that the overall energy efficiency and light distribution of any installation that uses such lamps are determined by the design of the installation.		
4.3.2	Claims that an LED lamp replaces a fluorescent lamp without integrated ballast of a particular wattage may be made only if:		N
	— the luminous intensity in any direction around the tube axis does not deviate by more than 25 % from the average luminous intensity around the tube, and		N
	— the luminous flux of the LED lamp is not lower than the luminous flux of the fluorescent lamp of the claimed wattage. The luminous flux of the fluorescent lamp shall be obtained by multiplying the claimed wattage with the minimum luminous efficacy value corresponding to the fluorescent lamp in Commission Regulation (EC) No 245/2009 and		N
	— the wattage of the LED lamp is not higher than the wattage of the fluorescent lamp it is claimed to replace.		N
	The technical documentation file shall provide the data to support such claims.		N

Table 2	Maximum energy efficiency index (EEI)				P
Type reference:	MH-FDFX-100W				
Application date	Mains-voltage filament lamps	Other filament lamps	High-intensity discharge lamps	Other lamps	Measured Value
Stage 1	If Φuse > 450 lm: 1,75	If Φuse ≤ 450 lm: 1.20 If Φuse > 450 lm: 0,95	0,50	0,50	N
Stage 2	1.75	0.95	0.50	0.50	N
Stage 3	0.95	0.95	0.36	0.20	0.12

Table 3	Functionality requirements for directional compact fluorescent lamps		N
Type reference:			
Functionality parameter	Stage 1 except where indicated otherwise	Stage 3	Measured Stage 1
Lamp survival factor at 6 000 h	From 1 March 2014: ≥ 0,50	≥ 0,70	N
Lumen maintenance	At 2 000 h: ≥ 80 %	At 2 000 h: ≥ 83 % At 6 000 h: ≥ 70 %	N

COMMISSION REGULATION (EU) No 1194/2012 of 12 December 2012			
Clause	Requirement - Test	Result - Remark	Verdict

Number of switching cycles before failure	≥ half the lamp lifetime expressed in hours ≥ 10 000 if lamp starting time > 0,3 s	≥ lamp lifetime expressed in hours ≥ 30 000 if lamp starting time > 0,3 s	N
Starting time	< 2,0 s	< 1,5 s if P < 10 W < 1,0 s if P ≥ 10 W	N
Lamp warm-up time to 60 % Φ	< 40 s or < 100 s for lamps containing mercury in amalgam form	< 40 s or < 100 s for lamps containing mercury in amalgam form	N
Premature failure rate	≤ 5,0 % at 500 h	≤ 5,0 % at 1 000 h	N
Lamp power factor for lamps with integrated control gear	≥ 0,50 if P < 25 W ≥ 0,90 if P ≥ 25 W	≥ 0,55 if P < 25 W ≥ 0,90 if P ≥ 25 W	N
Colour rendering (Ra)	≥ 80 ≥ 65 if the lamp is intended for outdoor or industrial applications according to point 3.1.3(l) of this Annex	≥ 80 ≥ 65 if the lamp is intended for outdoor or industrial applications according to point 3.1.3(l) of this Annex	N

Table 4	Functionality requirements for other directional lamps (excluding LED lamps, compact fluorescent lamps and high-intensity discharge lamps)		N
Type reference:			
Functionality parameter	Stage 1 and 2	Stage 3	Measured Stage 1
Rated lamp lifetime at 50 % lamp survival	≥ 1 000 h (≥ 2 000 h in stage 2) ≥ 2 000 h for extra low voltage lamps not complying with the stage 3 filament lamp efficiency requirement in point 1.1 of this Annex	≥ 2 000 h ≥ 4 000 h for extra low voltage lamps	N
Lumen maintenance	≥ 80 % at 75 % of rated average lifetime	≥ 80 % at 75 % of rated average lifetime	N
Number of switching cycles	≥ four times the rated lamp life expressed in hours	≥ four times the rated lamp life expressed in hours	N
Starting time	< 0,2 s	< 0,2 s	N
Lamp warm-up time to 60 % Φ	≤ 1,0 s	≤ 1,0 s	N
Premature failure rate	≤ 5,0 % at 100 h	≤ 5,0 % at 200 h	N
Lamp power factor for lamps with integrated	Power > 25 W: ≥ 0,9 Power ≤ 25 W: ≥ 0,5	Power > 25 W: ≥ 0,9 Power ≤ 25 W: ≥ 0,5	N

COMMISSION REGULATION (EU) No 1194/2012 of 12 December 2012			
Clause	Requirement - Test	Result - Remark	Verdict

control gear			

Table 5	Functionality requirements for non-directional and directional LED lamps		P
Type reference:			
Functionality parameter	Requirements		Measured Stage 3
Lamp survival factor at 6 000 h:	From 1 March 2014: ≥ 0,90	See test data sheet	P
Lumen Maintenance at 6 000 h:	From 1 March 2014: ≥ 0,80	See test data sheet	P
-Number of switching cycles before failure:	≥ 15 000 if rated lamp life ≥ 30 000 h otherwise: ≥ half the rated lamp life expressed in hours	See test data sheet	P
- Starting time:	< 0.5 s	See test data sheet	P
- Lamp warm-up time to 95%Φ:	< 2 s	See test data sheet	P
- Premature failure rate:	≤ 5,0% at 1 000 h	See test data sheet	-
-Colour rendering (Ra):	≥ 80; ≥ 65 if the lamp is intended for outdoor or industrial applications in accordance with point 3.1.3(l) of this Annex	See test data sheet	P
-Colour consistency:	Variation of chromaticity coordinates within a six-step MacAdam ellipse or less.	See test data sheet	P
-Lamp power factor (PF) for lamps with integrated control gear:	P ≤ 2 W: no requirement; 2 W < P ≤ 5 W: PF > 0,4; 5 W < P ≤ 25 W: PF > 0,5; P > 25 W: PF > 0,9	See test data sheet	P

Tables

<table>
<tr><td colspan="4">Table13A. Energy class</td></tr>
<tr><td>Standard</td><td>Clause</td><td>Model No.</td><td>Verdict</td></tr>
<tr><td>EU 874/2012
EU 1194/2012</td><td>Energy class A++</td><td>MH-FDFX-100W</td><td>P</td></tr>
<tr><td>Conditions</td><td colspan="3">-Test procedure:
Tungsten filament lamp-EN 60064;
CFL-EN 60969
LED lamp- IEC/PAS 62612
Tungsten halogen lamp-EN 60357
-test conditions:
-ambition: 25℃/65%R.H.
-Test voltage: 230V~</td></tr>
<tr><td>Luminous Flux of the lamp</td><td colspan="3">11276.6 lm</td></tr>
<tr><td>((EU) No 874/2012 ANNEX VII)</td><td colspan="3">P_{cor} is the rated power (P rated) for models without external control gear and the rated power (P rated) corrected in accordance with Table 2 for models with external control gear. The rated power of the lamps is measured at their nominal input voltage.</td></tr>
<tr><td colspan="4">Table 2
Power correction if the model requires external control gear
<table><tr><th>Scope of the correction</th><th>Power corrected for control gear losses (P_{cor})</th></tr><tr><td>Lamps operating on external halogen lamp control gear</td><td>$P_{rated} \times 1{,}06$</td></tr><tr><td>Lamps operating on external LED lamp control gear</td><td>$P_{rated} \times 1{,}10$</td></tr><tr><td>Fluorescent lamps of 16 mm diameter (T5 lamps) and 4-pin single capped fluorescent lamps operating on external fluorescent lamp control gear</td><td>$P_{rated} \times 1{,}10$</td></tr><tr><td>Other lamps operating on external fluorescent lamp control gear</td><td>$P_{rated} \times \frac{0{,}24\sqrt{\Phi_{use}} + 0{,}0103\Phi_{use}}{0{,}15\sqrt{\Phi_{use}} + 0{,}0097\Phi_{use}}$</td></tr><tr><td>Lamps operating on external high-intensity discharge lamp control gear</td><td>$P_{rated} \times 1{,}10$</td></tr><tr><td>Lamps operating on external low pressure sodium lamp control gear</td><td>$P_{rated} \times 1{,}15$</td></tr></table></td></tr>
<tr><td>P_{ref} ((EU) No 874/2012 ANNEX VII)</td><td colspan="3">P_{ref} is the reference power obtained from the useful luminous flux of the model (Φ use) by the following formulae:
For models with Φ use < 1 300 lumen: P ref = 0,88 √ Φ use + 0,049 Φ use
For models with Φ use ≥ 1 300 lumen: P ref = 0,07341 Φ use</td></tr>
</table>

Tables

<table>
<tr><td colspan="2">The useful luminous flux (Φ use) is defined in accordance with Table 3.</td><td colspan="4">
Table 3
Definition of the useful luminous flux
<table>
<tr><th>Model</th><th>Useful luminous flux (Φ_{use})</th></tr>
<tr><td>Non-directional lamps</td><td>Total rated luminous flux (Φ)</td></tr>
<tr><td>Directional lamps with a beam angle ≥ 90° other than filament lamps and carrying a textual or graphical warning on their packaging that they are not suitable for accent lighting</td><td>Rated luminous flux in a 120° cone ($\Phi_{120°}$)</td></tr>
<tr><td>Other directional lamps</td><td>Rated luminous flux in a 90° cone ($\Phi_{90°}$)</td></tr>
</table>
</td></tr>
<tr><td colspan="2">Technical requirements</td><td colspan="4">Test result</td></tr>
<tr><td colspan="2">EEI=Pcor/Pref</td><td colspan="2">For non-direction lamp</td><td colspan="2">For direction lamp</td></tr>
<tr><td colspan="2" rowspan="7">EEI=Pcor/Pref
=99.42W/827.82</td><td>A++</td><td>EEI≤0.11</td><td>A++</td><td>EEI≤0.13</td></tr>
<tr><td>A+</td><td>0.11＜EEI≤0.17</td><td>A+</td><td>0.13＜EEI≤0.18</td></tr>
<tr><td>A</td><td>0.17＜EEI≤0.24</td><td>A</td><td>0.18＜EEI≤0.40</td></tr>
<tr><td>B</td><td>0.24＜EEI≤0.60</td><td>B</td><td>0.40＜EEI≤0.95</td></tr>
<tr><td>C</td><td>0.60＜EEI≤0.80</td><td>C</td><td>0.95＜EEI≤1.20</td></tr>
<tr><td>D</td><td>0.80＜EEI≤0.95</td><td>D</td><td>1.20＜EEI≤1.75</td></tr>
<tr><td>E</td><td>0.95＜EEI</td><td>E</td><td>1.75＜EEI</td></tr>
<tr><td>Energy class</td><td>EEI=0.12</td><td colspan="2">--</td><td colspan="2">A++</td></tr>
</table>

Tables

Test result

Sample No.	Starting time (s)	Lamp warm-up time to 95 % Φ	Switching Cycle	Premature Failure Rate 1000h	Power (W)	Power Factor	Luminous Flux total (lm)	Efficacy (lm/W)	Color Temp (CCT)	Color rendering (Ra)	SDCM	Luminous flux (lm) After 6000h	Lumen Maintenance (%)	Lamp survival factor at 6000h
1	0.138	0.221	15000	0	100.41	0.929	11069.5	110.2	6968	80.3	3.5	10108.8	91.32%	100%
2	0.147	0.189	15000	0	100.55	0.925	11335.6	112.7	6818	80.3	3.5	10508.5	92.70%	100%
3	0.140	0.187	15000	0	100.67	0.925	11438.4	113.6	7134	81.3	3.9	10537.3	92.12%	100%
4	0.135	0.218	15000	0	100.36	0.937	11157.1	111.2	6929	81.1	4.0	10353.4	92.80%	100%
5	0.139	0.165	15000	0	99.09	0.927	11212.3	113.1	6882	80.2	3.2	10371.3	92.50%	100%
6	0.140	0.173	15000	0	100.56	0.931	11191.8	111.3	6958	81.1	4.1	10138.0	90.58%	100%
7	0.135	0.185	15000	0	99.37	0.941	11207.9	112.8	6950	81.0	3.7	10461.0	93.34%	100%
8	0.126	0.159	15000	0	97.99	0.940	11069.7	113.0	6753	81.0	3.0	10203.3	92.17%	100%
9	0.118	0.194	15000	0	97.38	0.948	11060.4	113.6	7141	80.4	3.3	10107.0	91.38%	100%
10	0.113	0.175	15000	0	99.29	0.939	11393.4	114.7	7131	81.3	3.1	10420.3	91.46%	100%
11	0.134	0.197	15000	0	99.44	0.949	11222.4	112.9	6952	81.1	4.1	10342.2	92.16%	100%
12	0.159	0.215	15000	0	100.28	0.930	11282.4	112.5	6999	80.3	4.1	10236.9	90.73%	100%
13	0.181	0.192	15000	0	98.30	0.911	11131.8	113.2	6844	81.3	4.1	10390.4	93.34%	100%
14	0.175	0.206	15000	0	98.98	0.925	11440.9	115.6	7012	80.2	4.0	10572.0	92.41%	100%
15	0.177	0.192	15000	0	97.81	0.929	11451.2	117.1	6952	81.4	4.2	10519.7	91.87%	100%
16	0.157	0.163	15000	0	97.07	0.924	11361.4	117.0	6950	81.1	4.1	10509.2	92.50%	100%
17	0.161	0.179	15000	0	101.67	0.951	11450.8	112.6	6985	80.2	4.0	10601.5	92.58%	100%
18	0.188	0.221	15000	0	99.47	0.930	11437.5	115.0	7099	81.1	3.8	10506.9	91.86%	100%
19	0.156	0.203	15000	0	99.17	0.924	11457.6	115.5	6991	80.4	4.0	10428.5	91.02%	100%
20	0.140	0.201	15000	0	100.63	0.931	11160.2	110.9	7070	80.2	3.9	10214.7	91.53%	100%
Avg.	0.148	0.192	15000	0	99.42	0.932	11276.6	113.4	6976	80.8	3.8	10376.5	92.02%	100%

Pictures

Fig.1

Fig.2

- End of report -