Test Report

On Behalf of

SHANGHAI MILANLUX LIGHTING CO,LTD

LED BULBS

Model : MLB12D/W, MLB05D/W, MLB06D/W, MLB07D/W, MLB09D/W, MLB10D/W, MLB11D/W, MLB15D/W, MLB18D/W, MLB20D/W, MLB24D/W, MLB30D/W, MLB40D/W, MLB50D/W, MLB60D/W

Prepared for : SHANGHAI MILANLUX LIGHTING CO,LTD
517MILANLUX,SUNLAND-MEI CENTER,NO.519 QIFAN ROAD, SHANGHAI, CHINA

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TEST REPORT
EN 62560
Self-Ballasted LED-Lamp
for general lighting services by voltage > 50V Safety specifications

Report Number.....:	TMC220625103-S
Date of issue.....:	July 08, 2022
Total number of pages.....:	18 pages
Name of Testing Laboratory preparing the Report.....:	TMC Testing Services(Shenzhen) Co., Ltd.
Applicant's name.....:	SHANGHAI MILANLUX LIGHTING CO,LTD
Address.....:	517MILANLUX,SUNLAND-MEI CENTER,NO.519 QIFAN ROAD, SHANGHAI, CHINA
Test specification:	
Standard.....:	EN 62560:2012+A11:2019; EN 62471:2008; EN 62493:2015
Test procedure.....:	Type Test
Non-standard test method.....:	N/A
Test Report Form No.....:	IEC62560C
Test Report Form(s) Originator.....:	DEKRA Certification B.V.
Master TRF.....:	Dated 2018-12-21

General disclaimer:

The test results presented in this report relate only to the object tested.

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Test item description.....:	LED BULBS
Trade Mark.....:	N/A
Manufacturer.....:	SHANGHAI MILANLUX LIGHTING CO,LTD
Address.....:	ECONOMIC DEVELOPMENT ZONE, HUOSHAN, LU'AN, Anhui, P.R. China
Model.....:	MLB12D/W, MLB05D/W, MLB06D/W, MLB07D/W, MLB09D/W, MLB10D/W, MLB11D/W, MLB15D/W, MLB18D/W, MLB20D/W, MLB24D/W, MLB30D/W, MLB40D/W, MLB50D/W, MLB60D/W
Ratings.....:	85-265V~, 50/60Hz, 60W

☒	**Testing Laboratory:**		
Testing location/ address.....:		TMC Testing Services(Shenzhen) Co., Ltd. 1st Floor, Block A1, Zone A, Xinshidai Gongrong Industrial Park, No. 2, Shihuan Road, Shiyan Street, Baoan District, Shenzhen, China	
Tested by (name, function, signature).....:		Bart Deng	Bert Deng
Approved by (name, function, signature).:		Seven Liu	Seven Liu

List of Attachments (including a total number of pages in each attachment):
Attachment No. 1: 2 pages of photo documentation.

Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
IEC 62560(ed.1); am1 IEC 62471:2008	TMC Testing Services(Shenzhen) Co., Ltd. 1st Floor, Block A1, Zone A, Xinshidai Gongrong Industrial Park, No. 2, Shihuan Road, Shiyan Street, Baoan District, Shenzhen, China

Summary of compliance with National Differences:

List of countries addressed

☒ The product fulfils the requirements of Germany and European Group differences

EN 62560:2012+A11:2019;

EN 62471:2008;

EN 62493:2015

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

LED BULBS

Model: MLB12D/W
Rating: 85-265V~, 50/60Hz, 60W

Importer:xxxxxx
Address:xxxxxx

SHANGHAI MILANLUX LIGHTING CO,LTD
MADE IN CHINA

Remarks:

1. Representative markings of MLB12D/W, markings of all models are identical except for the model name and rating.

2. Height of CE mark at least 5mm, height of WEEE symbol should not less than 7mm, height of other marks at least 5mm, height of letters and numerals at least 2mm.

Test item particulars..... :	
Classification of installation and use.....:	Self-Ballasted LED-Lamp for general lighting services by voltage > 50V
Supply Connection.....:	E27 Lamp cap
Degree of Protection.....:	IP20
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)
Testing.....:	
Date of receipt of test item.....:	June 25, 2022
Date (s) of performance of tests.....:	June 25, 2022 – July 08, 2022

General remarks:

This report shall not be reproduced except in full without the written approval of the testing laboratory.
The test results presented in this report relate only to the item tested.
"(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.

According to the EU directives which have been aligned with EU NLF (new legislative framework), both of manufacturer and importer's name and address shall be affixed on the product or, where that is not possible, on its packaging or in a document accompanying the product before the product is placed on the EU market.

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....:	☐ **Yes** ☒ **Not applicable**

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies).....: Same as manufacturer

General product information:

- All models have similar construction except power are difference.
- Unless otherwise specified, the model MLB12D/W was chosen as representative model to perform all test.

EN 62560			
Clause	Requirement + Test	Result - Remark	Verdict
4	**GENERAL REQUIREMENTS**		**P**
4.1	The lamp shall be so designed and constructed that in normal use cause no danger to the user.		P
4.2	Self-ballasted LED-Lamp are non-repairable.		P
5	**MARKING**		**P**
5.1	Mandatory marking		P
	- mark of origin		P
	- rated supply voltage (V)..... :	85-265V~	P
	- rated wattage (W)..... :	60W	P
	- rated frequency (Hz)..... :	50/60Hz	P
5.2	Addition marking		P
	- rated current (A)..... :		P
	- weight significantly higher		P
	- special conditions or restrictions		N/A
	Not suitable for dimming; symbol used 		P
	- not suitable for water contact		P
5.3	Marking durable and legible		P
	rubbing 15 s water, 15 s petroleum; marking legible		P
6	**INTERCHANGEABILITY**		**P**
6.1	Cap interchangeability in accordance with IEC 60061-1		P
	Gauge in accordance with IEC 60061-3		P
6.2	Bending moment and mass imparted by the lamp at the lampholder		P
	Bending moment imparted by the lamp at the lampholder (Nm)..... :		P
	Mass not exceeding value table 2 or as specified in IEC 60061-1 (kg)..... :		P
7	**PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS**		**P**
	Internal, basic insulated or live metal parts not accessible		P
	Tested with a test finger with a force of 10 N		P
	Compliance checked with appropriate gauges		P

EN 62560			
Clause	Requirement + Test	Result - Remark	Verdict
8	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		**P**
8.2	After storage 48 h at 91- 95% relative humidity and 20- 30 °C measuring of insulation resistance with d.c. 500 V (MΩ):		P
	≥ 4 MΩ for double or reinforced insulation.....:	>100 MΩ	P
8.3	Immediately after clause 8.2 electric strength test for 1 min		P
	Double or reinforced insulation, 4U + 2000 V	3060V, 1min, no breakdown	P
	No flashover or breakdown		P
9	**MECHANICAL STRENGTH**		**P**
	Torsion resistance of unused lamps		P
9.2.1	Torque test		P
	B15d or E14 Cap..... 1,15 Nm		N/A
	B22d, E26, E26d or E27 Cap.....3,0 Nm	E27 Cap: 3.0Nm	P
	E11 or E12 Cap.....0,8 Nm		N/A
	E17 Cap.....1,5 Nm		N/A
	E39 or E40 Cap.....5,0 Nm		N/A
	GX53 Cap.....3,0 Nm		N/A
9.3	Compliance criteria		P
	Clause 8 shall comply after the mechanical strength test.		P
9.4	Axial strength of Edison caps		P
	After full insertion into the gauge an axial force of Table 4 is applied to the central contact (N).....:		P
	The insulation around the central contact shall remain intact		P
10	**CAP TEMPERATURE RISE**		**P**
	The cap temperature rise Δt_s of the lamp shall not exceed 120 K.	See ANNEX 2	P
11	**RESISTANCE TO HEAT**		**P**
	Parts of insulating material providing protection against electric shock, retaining live parts in position, ball-pressure test:	(see appended table)	P

EN 62560			
Clause	Requirement + Test	Result - Remark	Verdict
12	**RESISTANCE TO FLAME AND IGNITION**		**P**
	External parts of insulating material preventing electric shock glow-wire test 650 °C	(see appended table)	P
13	**FAULT CONDITIONS**		**P**
13.2	Fault conditions: where diagram indicates fault condition impairs safety, electronic components have been short-circuited or disconnected	(see appended table)	P
13.3	When operated under fault conditions the lamp		P
	- does not emit flames or molten material		P
	- does not produce flammable gases or smoke		P
	- live parts not accessible		P
	After the tests the insulation resistance with d.c. 1000 V complies with requirements of Cl. 8.1.....:		P
14 (16)	**CREEPAGE DISTANCES AND CLEARANCES**		**P**
	Creepage distances and clearances according to IEC 61347-1	(see appended table)	P
	Conductive accessible parts according to IEC 60598-1	(see appended table)	P
15	**ABNORMAL OPERATION**		**P**
	Non-dimmable self-ballasted lamps are tested on a dimmer or an electronic switch according the test circuit shown in Figure 8		P
	Operate the lamp for 8 h at most onerous dimming level		P
	When operated under abnormal operation the lamp		P
	- does not catch fire		P
	- does not produce flammable gases		P
	- live parts not accessible		P
16	**TEST CONDITIONS FOR DIMMABLE LAMPS**		**N/A**
	Test are carried out at maximum power setting for Clause 10 and Clause 17		N/A
17	**PHOTOBIOLOGICAL SAFETY**		**P**
17.1	UV radiation		N/A

EN 62560			
Clause	Requirement + Test	Result - Remark	Verdict
	The LED lamp doesn't exceed 2mW/klm		N/A
17.2	Blue light hazard		P
	Assessed according to IEC TR 62778		P
	LED lamps shall be RG0 or RG1	RG0	P

18	**INGRESS PROTECTION**		**P**
18.1	Lamps shall be suitable for water contact unless marked with Figure 6	IP20	P
18.2	The lamp is subjected to an IPX4 test according to IEC 60598-1		N/A
	The lamp complies with the compliance provisions of 9.2 of IEC 60598-1		N/A
	Lamps constructed so that it is sealed to exclude water need not to be tested		N/A

EN 62560			
Clause	Requirement + Test	Result - Remark	Verdict

11	TABLE: Ball Pressure Test of Thermoplastics			P
Allowed impression diameter (mm)		2,0mm		—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)	
Enclosure	--	75°C	0,8mm	
Translucent cover	--	75°C	1.0mm	
Supplementary information:--				

12	TABLE: Resistance to heat and fire - Glow wire tests				P
Glow wire temperature		650°C			—
Object/ Part No./ Material	Manufacturer/ trademark	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict	
Enclosure	--	30s	No	0s	
Translucent cover	--	30s	No	0s	
Any flame or glowing of the sample extinguished within 30 s of withdrawing the glow-wire, and any burning or molten drop did not ignite the underlying parts (Yes/No).....				Yes	
Supplementary information:--					

13	TABLE: tests of fault conditions		P
Part	Simulated fault	Result	Hazard
Output	s-c	Shut down, recoverable, no damage	NO
Note:S-C; short circuit ; O-C; open circuit			

14	TABLE: Clearance And Creepage Distance Measurements					P
Test Location	Working voltage	Measured cl (mm)	Required cl (mm)	Measured cr (mm)	Required cr (mm)	Verdict
L/N	85-265V~	3,2	1,5	3,2	2,5	Pass
Current-carrying parts and accessible parts	85-265V~	5,6	3,0	5,6	5,0	Pass

ANNEX 1	TABLE: Critical components information					
Object / part No.	**Code**	**Manufacturer/ trademark**	**Type / model**	**Technical data**	**Standard**	**Mark(s) of conformity[1)]**
Fuse	B	Various	Various	250V, T2A	IEC/EN 60127-4	VDE
PCB Board	B	Various	Various	V-0;130℃	UL796 UL94	UL

Supplementary information:

[1)] Provided evidence ensures the agreed level of compliance. See OD-CB2039.

The codes above have the following meaning:

A - The component is replaceable with another one, also certified, with equivalent characteristics

B - The component is replaceable if authorised by the test house

C - Integrated component tested together with the appliance

D - Alternative component

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 10		P
	Type reference.....:	60W	—
	Lamp used.....:	LED	—
	Supply wattage (W).....:	58.2W	—
	Supply current (A)..... :	0.472A	—
	Calculated power factor.....:	0.48	—
	Table: measured temperatures corrected for ta = 25 °C:		P
	- abnormal operating mode.....:		—
	- test 1: rated voltage.....:	230V~	—

Temperature measurements, (°C)

Part	Ambient	Clause 10 – normal		
		test 1	limit	Verdict
E27 Lamp cap	25℃	61.5	145	Pass
LED PCB	25℃	80.1	90	Pass
Translucent cover	25℃	42.6	Ref	Pass
Plastic enclosure, inside, near LED	25℃	59.3	Ref.	Pass

Supplementary information:

	ANNEX 3: EMF test result according to IEC/EN 62493				P
4.2.d	**MEASUREMENT RESULTS**				P
	Measuring with “Van der Hoofden” test head				P
	EUT operation model: ☒ Normal operation ☐ Other operation:				P
	Voltage:	85-265V~	Frequency:	50Hz	--
	Temperature:	25°C	Humidity:	55% R.H.	--
	Location of EuT	Measuring distance (cm)	Result (F)	Limit (F)	Verdict
	MLB12D/W	50	0.08431	0,85	P

EN 62471			
Cl.	Requirement – Test	Result	Verdict
1	SCOPE		P
	More sections applicable.....:	Yes [√] No [ ]	—
Annex ZB 4	EXPOSURE LIMITS		P
4.1	General		P
	The exposure limits in this standard is not less than 0,01 ms and not more than any 8-hour period and should be used as guides in the control of exposure		P
	Detailed spectral data of a light source are generally required only if the luminance of the source exceeds 10^4 cd.m -2	see clause 4.3	P
4.3	Hazard exposure limits		P
4.3.1	Actinic UV hazard exposure limit for the skin and eye		P
	The exposure limit for effective radiant exposure is 30 $J \cdot m^{-2}$ within any 8-hour period		P
	To protect against injury of the eye or skin from ultraviolet radiation exposure produced by a broadband source, the effective integrated spectral irradiance , ES, of the light source shall not exceed the levels defined by:		P
	The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye or skin shall be computed by:		P
4.3.2	Near-UV hazard exposure limit for the eye		P
	For the spectral region 315 nm to 400 nm (UV-A) the total radiant exposure to the eye shall not exceed 10000 $J \cdot m^{-2}$ for exposure times less than 1000 s. For exposure times greater than 1000 s (approximately 16 minutes) the UV-A irradiance for the unprotected eye, E_{UVA}, shall not exceed 10 W.m -2.		P
	The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye for time less than 1000 s, shall be computed by:		P
4.3.3	Retinal blue light hazard exposure limit		P
	To protect against retinal photochemical injury from chronic blue-light exposure, the integrated spectral radiance of the light source weighted against the blue-light hazard function, B(λ), i.e., the blue-light weighted radiance , LB, shall not exceed the levels defined by:		P
4.3.4	Retinal blue light hazard exposure limit - small source		N/A
	Thus the spectral irradiance at the eye Eλ, weighted against the blue-light hazard function B(λ) shall not exceed the levels defined by::	see table 4.2	N/A

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Cl.	Requirement – Test	Result	Verdict
4.3.5	Retinal thermal hazard exposure limit		N/A
4.3.6	Retinal thermal hazard exposure limit – weak visual stimulus		N/A
4.3.7	Infrared radiation hazard exposure limits for the eye		P
4.3.8	Thermal hazard exposure limit for the skin		P
5	MEASUREMENT OF LAMPS AND LAMP SYSTEMS		P
5.1	Measurement conditions		P
	Measurement conditions shall be reported as part of the evaluation against the exposure limits and the assignment of risk classification.		P
5.1.1	Lamp ageing (seasoning)..... :		--
	Seasoning of lamps shall be done as stated in the appropriate IEC lamp standard.		--
5.1.2	Test environment..... :		P
	For specific test conditions, see the appropriate IEC lamp standard or in absence of such standards, the appropriate national standards or manufacturer's recommendations.		P
5.1.3	Extraneous radiation..... :		P
	Careful checks should be made to ensure that extraneous sources of radiation and reflections do not add significantly to the measurement results.		P
5.1.4	Lamp operation..... :		P
	Operation of the test lamp shall be provided in accordance with:		P
	– the appropriate IEC lamp standard, or		--
	– the manufacturer' s recommendation		P
5.1.5	Lamp system operation.....:		N/A
	The power source for operation of the test lamp shall be provided in accordance with:		N/A
	– the appropriate IEC standard, or		N/A
	– the manufacturer' s recommendation		N/A
5.2	Measurement procedure		P
5.2.1	Irradiance measurements.....:		P
	Minimum aperture diameter 7mm.		P
	Maximum aperture diameter 50 mm.		P
	The measurement shall be made in that position of the beam giving the maximum reading		P

EN 62471			
Cl.	Requirement – Test	Result	Verdict
	The measurement instrument is adequate calibrated.		P
5.2.2	Radiance measurements.....:		N/A
5.2.2.1	Standard method..... :		N/A
5.2.2.2	Alternative method.....:		P
5.2.3	Measurement of source size.....:		P
5.2.4	Pulse width measurement for pulsed sources..... :		N/A
5.3	Analysis methods		P
5.3.1	Weighting curve interpolations.....:		P
	To standardize interpolated values, use linear interpolation on the log of given values to obtain intermediate points at the wavelength intervals desired.	See table 4.1	P
5.3.2	Calculations..... :		P
5.3.3	Measurement uncertainty.....:		P
	The quality of all measurement results must be quantified by an analysis of the uncertainty.		P
6	LAMP CLASSIFICATION		P
	For the purposes of this standard it was decided that the values shall be reported as follows:		P
	for lamps intended for general lighting service (GLS), see definition 3.11, the hazard values shall be reported as either irradiance or radiance values at a distance which produces an illuminance of 500 lux, but not at a distance less than 200 mm;		N/A
	for all other light sources, including pulsed lamp sources, the hazard values shall be reported at a distance of 200 mm.		P
6.1	Continuous wave lamps		P
6.1.1	Exempt group		P
	The philosophical basis for the exempt group classification is that the lamp does not pose any photobiological hazard for the end points in this standard. This requirement is met by any lamp thatdoes not pose		P
	an actinic ultraviolet hazard (*E*s) within 8-hours exposure (30000 s), nor		P
	a near-UV hazard (*E*UVA) within 1000 s, (about 16 min) nor		P
	a retinal blue-light hazard (*L*B) within 10000 s (about 2,8 h), nor		P

EN 62471			
Cl.	Requirement – Test	Result	Verdict
	a retinal thermal hazard (*L*R) within 10 s, nor		P
	an infrared radiation hazard for the eye (*E*IR) within 1000 s.		P
6.1.2	Risk Group 1 (Low-Risk)		N/A
	The philosophical basis for this classification is that the lamp does not pose a hazard due to normalbehavioral limitations on exposure. This requirement is met by any lamp that exceeds the limits for theExempt Group but that does not pose		N/A
	an actinic ultraviolet hazard (*E*s) within 10000 s, nor		N/A
	a near ultraviolet hazard (*E*UVA) within 300 s, nor		N/A
	a retinal blue-light hazard (*L*B) within 100 s, nor		N/A
	a retinal thermal hazard (*L*R) within 10 s, nor		N/A
	an infrared radiation hazard for the eye (*E*IR) within 100 s.		N/A
6.1.3	Risk Group 2 (Moderate-Risk)		N/A
	The philosophical basis for the Risk Group 2 (Moderate-Risk) classification is that the lamp does notpose a hazard due to the aversion response to very bright light sources or due to thermal discomfort.This requirement is met by any lamp that exceeds the limits for Risk Group 1 (Low-Risk), but that doesnot pose		N/A
	an actinic ultraviolet hazard (*E*s) within 1000 s exposure, nor		N/A
	a near ultraviolet hazard (*E*UVA) within 100 s, nor		N/A
	a retinal blue-light hazard (*L*B) within 0,25 s (aversion response), nor		N/A
	a retinal thermal hazard (*L*R) within 0,25 s (aversion response), nor		N/A
	an infrared radiation hazard for the eye (*E*IR) within 10 s.		N/A
6.1.4	Risk Group 3 (High-Risk)		N/A
	The philosophical basis for this classification is that the lamp may pose a hazard even for momentary or brief exposure. Lamps which exceed the limits for Risk Group 2 (Moderate-Risk) are in Risk Group3 (High-Risk).		N/A
6.2	Pulsed lamps		N/A
	Pulsed lamp criteria shall apply to a single pulse and to any group of pulses within 0,25 second.		N/A

EN 62471			
Cl.	Requirement – Test	Result	Verdict

Luminance Test Results			
Symbol	FOV(mrad)	Units	Results
L1	1.7	cd/m^2	1.831E+06
L2	11	cd/m^2	2.766E+05
L3	100	cd/m^2	1.539E+04
Over view of Classification			
Hazard		Risk Group	
Actinic UV		Exempt Group	
Near UV		Exempt Group	
Blue light		Exempt Group	
Retinal thermal		Exempt Group	
Retinal thermal, weak visual stimulus		Exempt Group	
IR radiation, eye		Exempt Group	
Classification group		Exempt Group	

Attachment No.1

Photo Documentation

Fig. 1

Fig. 2

----------End of Test Report----------