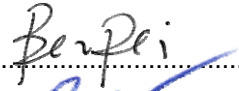
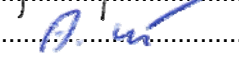


<b>TEST REPORT</b> <b>IEC 60598-2-4 and/or EN 60598-2-4</b> <b>Part 2: Particular requirements</b> <b>Section Four – Portable general purpose luminaires</b>	
Report Reference No. ....	85290
Tested by (name + signature) .....	Ben Pei 
Approved by (name + signature) .....	Alexander Neumaier 
Date of issue .....	2007-05-25
CB/CCA Testing Laboratory .....	Nemko GmbH & Co. KG Test and Certification Institute
Address .....	Reetzstraße 58, D - 76327 Pfinztal, Germany
Testing procedure .....	TL <input checked="" type="checkbox"/> RMT <input type="checkbox"/> SMT <input type="checkbox"/> WMT <input type="checkbox"/> TMP <input type="checkbox"/>
Testing location/address .....	Reetzstraße 58, D - 76327 Pfinztal, Germany
Applicant's name .....	Sundar Lighting Huizhou Co., Ltd.
Address .....	Yiu Long Tech-Industrial Zone, Yin Long Road Huizhou, Guandong, China.
<b>Test specification:</b>	
Standard .....	<input type="checkbox"/> IEC 60598-2-4:1997 used in conjunction with IEC 60598-1:2003 <input checked="" type="checkbox"/> EN 60598-2-4:1997 used in conjunction with EN 60598-1:2004 + A1: 2006 <input checked="" type="checkbox"/> EN 60598-2-20:1997+A1:1998+A2:2004
Test procedure .....	CB / CCA
Non-standard test method .....	N/A
Test Report Form No. ....	IECEN60598_2_4B
TRF Originator .....	Intertek Semko AB
Master TRF .....	Dated 2005-05
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Test item description .....	Candle Bridge Light
Trade Mark .....	Sundar Lighting Huizhou Co., Ltd.
Manufacturer .....	Sundar Lighting Huizhou Co., Ltd.
Address .....	Yiu Long Tech-Industrial Zone, Yin Long Road Huizhou, Guandong, China.
Model/Type reference .....	HH-.A. series
Ratings .....	Max. 30W, 5-10 bulbs á 24-48V/3W, F-symbol, E10, serial connected, Class II, IP20. 220-240V ~ 50Hz

**Name and address of production sites (Factories):**

Sundar Lighting Huizhou Co., Ltd.  
Yiu Long Tech-Industrial Zone, Yin Long Road  
Huizhou, Guandong, China.

**Copy of marking plate:**

**Sundar Lighting Co., Ltd**  
Typ: HH-5A  
220-240V ~ 50Hz 15W  
5 Lampen: 48V/3W



1. Vor dem Lampenwechsel Netzstecker ziehen !
2. Nur zur Verwendung in Innenräumen !
3. Die Leuchte nicht anschliessen, solange sie in der Verpackung ist.
4. Defekte Lampen müssen umgehend durch Lampen mit gleicher Spannungs- und Leistungsangabe ersetzen, um unzulässige Erwärmung zu vermeiden !
5. Es sind nur Ersatzlampen der gleichen Sorte zu verwenden, die mit dieser Leuchte zur Verfügung gestellt werden !
6. Diese Leuchte darf nicht elektrisch mit anderen Leuchten oder Lichterketten verbunden werden!

**Summary of testing:**

The tested samples are found to comply with the requirements of the relevant product standards.

**Marking label, user manual, packing text:**

Instructions and marking shall be in a language acceptable for the country where the equipment is to be used.

**Mains plug:**

If the equipment shall be used with a special mains plug which is not listed in the component list (e.g. United Kingdom), samples of the modified product must be subject to a test according to the relevant clauses of the product standard.

**Other product properties:**

Depending on the country where the equipment is to be used, national deviations may be considered. Samples of the modified product may be tested again according to relevant clauses of the product standard, modified by national deviations.

List of attachments:

ANNEX 1: components

ANNEX 2: temperature measurements

ANNEX 3: screw terminals

ANNEX 4: screwless terminals

ANNEX 5: pictures

ANNEX 6: user manual

ANNEX 7: Additional requirements of EN 60598-2-20



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<b>Test item particulars</b> .....				
<b>Possible test case verdicts:</b>				
- test case does not apply to the test object..... : N (Not applicable)				
- test object does meet the requirement..... : P (Pass)				
- test object does not meet the requirement..... : F (Fail)				
<b>Testing</b>				
Date of receipt of test item ..... : 2007-04-16				
Date (s) of performance of tests ..... : 2007-04-17 to 2007-04-30				
<b>General remarks:</b>				
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.				
List of test equipment must be kept on file and available for review.				
Throughout this report a comma (point) is used as the decimal separator.				
In this report requirements valid for EN only are marked with (EN).				
<b>General product information:</b>				
HH-.A. series:				
The first dot "." in the model name can be any number from 5 to 10 which denotes the number of bulb.				
The second dot "." in the model name can be blank or "P" which denotes the material of the enclosure (standard) is made of wood (blank) or plastic (P).				
The models listed below are included in this test report:				
Model	Number of bulb	Bulb voltage	Bulb wattage	Total wattage
HH-5A	5	48V	3 W	15 W
HH-7A	7	34V	3 W	21 W
HH-7AP	7	34V	3 W	21 W
HH-9A	9	25.5V	3 W	27 W
HH-10A	10	24V	3 W	30 W

IEC 60598-2-4 and/or EN 60598-2-4			
Clause	Requirement – Test	Result – Remark	Verdict

4.2 (0)	GENERAL TEST REQUIREMENTS		—
4.2 (0.1)	Information for luminaire design considered .....	Standard Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
4.2 (0.3)	More sections applicable .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> See Annex 7	—

4.4 (2)	CLASSIFICATION		—
4.4 (2.2)	Type of protection .....	Class II	—
4.4 (2.3)	Degree of protection .....	IP 20	—
4.4 (2.4)	Luminaire only suitable for non-combustible surfaces .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Luminaire suitable for normally flammable surfaces .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Luminaire suitable to be covered by insulating materials .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
4.4 (2.5)	Luminaire for normal use .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Luminaire for rough service .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—

4.5 (3)	MARKING		—
4.5 (3.2)	Mandatory markings		P
	Position of the marking		P
	Format of symbols/text		P
4.5 (3.3)	Additional information		P
	Language of instructions	German	P
4.5 (3.3.1)	Combination luminaires		N
4.5 (3.3.2)	Nominal frequency in Hz	50Hz	P
4.5 (3.3.3)	Operating temperature		N
4.5 (3.3.4)	Symbol or warning notice		N
4.5 (3.3.5)	Wiring diagram		N
4.5 (3.3.6)	Special conditions		N
4.5 (3.3.7)	Metal halide lamp luminaire – warning		N
4.5 (3.3.8)	Limitation for semi-luminaires		N
4.5 (3.3.9)	Power factor and supply current		N
4.5 (3.3.10)	Suitability for use indoors		N
4.5 (3.3.11)	Luminaires with remote control		N
4.5 (3.3.12)	Clip-mounted luminaire – warning		N

IEC 60598-2-4 and/or EN 60598-2-4			
Clause	Requirement – Test	Result – Remark	Verdict

4.5 (3.3.13)	Specifications of protective shields		N
4.5 (3.3.14)	Symbol for nature of supply		P
4.5 (3.3.15)	Rated current of socket outlet		N
4.5 (3.3.16)	Rough service luminaire		N
4.5 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments	Type Z	P
4.5 (3.3.18)	Non-ordinary luminaires with PVC cable		N
4.5. (3.3.101)	Adequate warning on the package (EN)		N
4.5 (3.4)	Test with water		P
	Test with hexane		P
	Legible after test		P
	Label attached		P

<b>4.6 (4)</b>	<b>CONSTRUCTION</b>		—
4.6.1 (-)	Insulation not damaged when placing on support		P
4.6.2 (-)	Wiring fixed, to avoid rubbing		P
4.6.3 (-)	Stability 6°		P
4.6.4 (-)	Candlestick luminaires with switch		P
4.6.5 (-)	E5 lampholders		N
4.6 (4.2)	Components replaceable without difficulty		N
4.6 (4.3)	Wireways smooth and free from sharp edges		P
4.6 (4.4)	Lampholders:		—
4.6 (4.4.1)	Integral lampholder		N
4.6 (4.4.2)	Wiring connection		N
4.6 (4.4.3)	Lampholder for end-to-end mounting		N
4.6 (4.4.4)	Positioning:		—
	- pressure test (N)..... :		N
	- bending test (Nm)..... :		N
4.6 (4.4.5)	Peak pulse voltage		N
4.6 (4.4.6)	Centre contact		N
4.6 (4.4.7)	Parts in rough service luminaires resistant to tracking		N
4.6 (4.4.8)	Lamp connectors		N
4.6 (4.4.9)	Caps and bases correctly used		N

IEC 60598-2-4 and/or EN 60598-2-4			
Clause	Requirement – Test	Result – Remark	Verdict
4.6 (4.5)	Starter holders:		—
	Starter holder in luminaires other than class II		N
	Starter holder class II construction		N
4.6 (4.6)	Terminal blocks:		N
	Tails		N
	Unsecured blocks		N
4.6 (4.7)	Terminals and supply connections:		—
4.6 (4.7.1)	Contact to metal parts		N
4.6 (4.7.2)	Test 8 mm live conductor		N
	Test 8 mm earth conductor		N
4.6 (4.7.3)	Terminals for supply conductors		N
4.6 (4.7.3.1)	Welded connections:		—
	- stranded or solid conductor		N
	- spot welding		N
	- welding between wires		N
	- Type Z attachment		N
	- mechanical test according to 15.8.2		N
	- electrical test according to 15.9		N
	- heat test according to 15.9.2.3 and 15.9.2.4		N
4.6 (4.7.4)	Terminals other than supply connection		N
4.6 (4.7.5)	Heat-resistant wiring/sleeves		N
4.6 (4.7.6)	Multi-pole plug		N
	- test at 30 N		N
4.6 (4.8)	Switches:		—
	- adequate rating	250V AC, 2A	P
	- adequate fixing		P
	- polarized supply		N
	- compliance with 61058-1 for electronic switches		N
4.6 (4.9)	Insulating lining and sleeves:		—
4.6 (4.9.1)	Retainment		P
	Method of fixing .....		P
4.6 (4.9.2)	Insulated linings and sleeves:		—
	a) & c) Insulation resistance and electric strength	Separately approved; See Annex 1	P
	b) Ageing test. Temperature (°C) .....	Separately approved; See Annex 1	P
4.6 (4.10)	Insulation of Class II luminaires:		—
4.6 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		N



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IEC 60598-2-4 and/or EN 60598-2-4			
Clause	Requirement – Test	Result – Remark	Verdict
	Safe installation fixed luminaires		N
	Capacitors and switches		N
	Interference suppression capacitors according to IEC 60384-14		N
4.6 (4.10.2)	Assembly gaps:		—
	- not coincidental		N
	- no straight access with test probe		N
4.6 (4.10.3)	Retention of insulation:		—
	- fixed		P
	- unable to be replaced; luminaire inoperative		N
	- sleeves retained in position		P
	- lining in lampholder		N
4.6 (4.11)	Electrical connections:		—
4.6 (4.11.1)	Contact pressure		P
4.6 (4.11.2)	Screws:		—
	- self-tapping screws		N
	- thread-cutting screws		N
	- at least two self-tapping screws		N
4.6 (4.11.3)	Screw locking:		—
	- spring washer		N
	- rivets		N
4.6 (4.11.4)	Material of current-carrying parts		P
4.6 (4.11.5)	No contact to wood		P
4.6 (4.11.6)	Electro-mechanical contact systems		N
4.6 (4.12)	Mechanical connections and glands:		—
4.6 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		N
	Torque test: torque (Nm); part .....	0.5Nm screw used in cord anchorage	P
	Torque test: torque (Nm); part .....		N
	Torque test: torque (Nm); part .....		N
4.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N

IEC 60598-2-4 and/or EN 60598-2-4			
Clause	Requirement – Test	Result – Remark	Verdict
4.6 (4.12.4)	Locked connections:		—
	- fixed arms; torque (Nm)..... :		N
	- lampholder; torque (Nm) ..... :		N
	- push-button switches; torque 0,8 Nm..... :		N
4.6 (4.12.5)	Screwed glands; force (N)..... :		N
4.6 (4.13)	Mechanical strength:		—
4.6 (4.13.1)	Impact tests:		—
	- fragile parts; energy (Nm)..... :		N
	- other parts; energy (Nm) ..... :	0.5Nm on the lamp holder	P
	- other parts; energy (Nm) ..... :	0.5Nm on the candle stick enclosure	P
	- other parts; energy (Nm) ..... :	0.5Nm on the plastic stand of model HH-7AP	P
	1) live parts		P
	2) linings		N
	3) protection		P
	4) covers		P
4.6 (4.13.3)	Straight test finger		P
4.6 (4.13.4)	Rough service luminaires:		—
	- IP54 or higher		N
	a) fixed		N
	b) hand-held		N
	c) delivered with a stand		N
	d) for temporary installations and suitable for mounting on a stand		N
4.6 (4.13.6)	Tumbling barrel		N
4.6 (4.14)	Suspensions and adjusting devices:		—
4.6 (4.14.1)	Mechanical load:		—
	A) four times the weight		N
	B) torque 2,5 Nm ..... :		N
	C) bracket arm; bending moment (Nm)..... :		N
	D) load track-mounted luminaires		N
	E) clip-mounted luminaires, glass-shelve. Thickness (mm) ..... :		N



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IEC 60598-2-4 and/or EN 60598-2-4			
Clause	Requirement – Test	Result – Remark	Verdict
	metal rod. Diameter (mm)..... :		N
4.6 (4.14.2)	Load to flexible cables:		—
	Mass (kg) ..... :		N
	Stress in conductors (N/mm <sup>2</sup> )..... :		N
	Mass (kg) of semi-luminaire ..... :		N
	Bending moment (Nm) of semi-luminaire..... :		N
4.6 (4.14.3)	Adjusting devices:		—
	- flexing test; number of cycles ..... :		N
	- strands broken		N
	- electric strength test afterwards		N
4.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N
4.6 (4.14.5)	Guide pulleys		N
4.6 (4.14.6)	Strain on socket-outlets		N
4.6 (4.15)	Flammable materials:		—
	- glow-wire test 650 °C		N
	- spacing $\geq$ 30 mm		N
	- screen withstanding test of 13.3.1		N
	- screen dimensions		N
	- no fiercely burning material		N
	- thermal protection		N
	- electronic circuits exempted		N
4.6 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear:		—
	a) construction		N
	b) temperature sensing control		N
	c) surface temperature		N
4.6 (4.16)	Luminaires marked with F-symbol:		—
	No lamp control gear	(compliance with Section 12)	P
4.6 (4.16.1)	Lamp control gear spacing:		—
	- spacing 35 mm		N
	- spacing 10 mm		N
4.6 (4.16.2)	Thermal protection:		—
	- in lamp control gear		N

IEC 60598-2-4 and/or EN 60598-2-4			
Clause	Requirement – Test	Result – Remark	Verdict
	- external		N
	- fixed position		N
	- temperature marked lamp control gear		N
4.6 (4.16.3)	“F” curve measured	(see 12.6)	N
4.6 (4.17)	Drain holes		N
	Clearance at least 5 mm		N
4.6 (4.18)	Resistance to corrosion:		—
4.6 (4.18.1)	- rust-resistance		N
4.6 (4.18.2)	- season cracking in copper		N
4.6 (4.18.3)	- corrosion of aluminium		N
4.6 (4.19)	Igniters compatible with ballast		N
4.6 (4.20)	Rough service vibration		N
4.6 (4.21)	Protective shield:		—
4.6 (4.21.1)	Shield fitted		N
4.6 (4.21.2)	Particles from a shattering lamp not impair safety		N
4.6 (4.21.3)	No direct path		N
4.6 (4.21.4)	Impact test on shield		N
	Glow-wire test on lamp compartment		N
4.6 (4.22)	Attachments to lamps		
4.6 (4.23)	Semi-luminaires comply Class II		N
4.6 (4.24)	UV radiation, metal halide lamps		N
4.6 (4.25)	No sharp point or edges		P
4.6 (4.26)	Short-circuit protection:		—
4.6 (4.26.1)	Uninsulated accessible SELV parts		N
4.6 (4.26.2)	Short-circuit test		N
4.6 (4.26.3)	Test chain according to Figure 29		N
<b>4.7 (11)</b>	<b>CREEPAGE DISTANCES AND CLEARANCES</b>		
	Working voltage (V) .....	240V	—

IEC 60598-2-4 and/or EN 60598-2-4			
Clause	Requirement – Test	Result – Remark	Verdict
	Voltage form	Sinusoidal <input checked="" type="checkbox"/> Non-sinusoidal <input type="checkbox"/>	—
	PTI	< 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/>	—
	Rated pulse voltage (kV) .....		—
	(1) Current-carrying parts of different polarity: cr (mm); cl (mm) .....	cr>2.5 mm/ cl>1.7 mm	P
	(2) Current-carrying parts and accessible parts: cr (mm); cl (mm) .....	cr>6.5 mm/ cl>6.5 mm	P
	(3) Parts becoming live due to breakdown of basic insulation and metal parts: cr (mm); cl (mm) .....		N
	(4) Outer surface of cable where it is clamped and metal parts: cr (mm); cl (mm) .....		N
	(5) Not used		—
	(6) Current-carrying parts and supporting surface: cr (mm); cl (mm) .....	cr>6.5 mm/ cl>6.5 mm	P

<b>4.8 (7)</b>	<b>PROVISION FOR EARTHING</b>		—
4.8 (7.2.1 + 7.2.3)	Accessible metal parts		N
	Metal parts in contact with supporting surface		N
	Resistance < 0,5 Ω		N
	Two self-tapping screws used		N
	Thread-forming screws		N
	Thread-forming screw used in a groove		N
	Earth makes contact first		N
4.8 (7.2.2 + 7.2.3)	Earth continuity in joints etc.		N
4.8 (7.2.4)	Locking of clamping means		N
	Compliance with 4.7.3		N
4.8 (7.2.5)	Earth terminal integral part of connector socket		N
4.8 (7.2.6)	Earth terminal adjacent to mains terminals		N
4.8 (7.2.7)	Electrolytic corrosion of the earth terminal		N
4.8 (7.2.8)	Material of earth terminal		N
	Contact surface bare metal		N
4.8 (7.2.10)	Class II luminaire for looping-in		N
	Double or reinforced insulation to functional earth		N
4.8 (7.2.11)	Earthing core coloured green-yellow		N
	Length of earth conductor		N



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Clause	Requirement – Test	Result – Remark	Verdict
<b>4.9 (14)</b>	<b>SCREW TERMINALS</b>		—
	Separately approved; component list	(see Annex 1)	N
	Part of the luminaire	(see Annex 3)	N
<b>4.9 (15)</b>	<b>SCREWLESS TERMINALS</b>		—
	Separately approved; component list	(see Annex 1)	N
	Part of the luminaire	(see Annex 4)	N
<b>4.10 (5)</b>	<b>EXTERNAL AND INTERNAL WIRING</b>		—
4.10 (5.2)	Supply connection and external wiring:		—
4.10 (5.2.1)	Means of connection.....:	Type Z attachment	P
	Connecting leads (EN):		—
	- without a means for connection to the supply		N
	- terminal block specified		N
	- relevant information provided		N
	- compliance with 4.6, 4.7.1, 4.7.2, 4.10.1, 11.2, 12 and 13.2 of Part 1		N
4.10 (5.2.2)	Type of cable .....	H03VVH2-F	P
	Cables equal to HD 21 S2 or HD22 S2 (EN)		P
	Nominal cross-sectional area (mm <sup>2</sup> ) .....	2 x 0.75mm <sup>2</sup>	P
4.10 (5.2.3)	Type of attachment, X, Y or Z	Type Z attachment	P
4.10 (5.2.5)	Type Z not connected to screws		P
4.10 (5.2.6)	Cable entries:		—
	- suitable for introduction		P
	- adequate degree of protection		P
4.10 (5.2.7)	Cable entries through rigid material have rounded edges		P
4.10 (5.2.8)	Insulating bushings:		—
	- suitably fixed		N
	- material in bushings		N
	- material not likely to deteriorate		N
	- tubes or guards made of insulating material		N
4.10 (5.2.9)	Locking of screwed bushings		N



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IEC 60598-2-4 and/or EN 60598-2-4			
Clause	Requirement – Test	Result – Remark	Verdict
4.10 (5.2.10)	Cord anchorage:		—
	- covering protected from abrasion		P
	- clear how to be effective		P
	- no mechanical or thermal stress		P
	- no tying of cables into knots etc.		P
	- insulating material or lining		P
4.10 (5.2.10.1)	Cord anchorage for type X attachment:		—
	a) at least one part fixed		N
	b) types of cable		N
	c) no damaging of the cable		N
	d) whole cable can be mounted		N
	e) no touching of clamping screws		N
	f) metal screw not directly on cable		N
	g) replacement without special tool		N
	Glands not used as anchorage		N
	Labyrinth type anchorages		N
4.10 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		P
4.10 (5.2.10.3)	Tests:		—
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N) ..... : 60N		P
	- torque test: torque (Nm) ..... : 0.15Nm		P
	- displacement $\leq 2$ mm		P
	- no movement of conductors		P
	- no damage of cable or cord		P
4.10 (5.2.11)	External wiring passing into luminaire		P
4.10 (5.2.12)	Looping-in terminals		N
4.10 (5.2.13)	Wire ends not tinned		P
	Wire ends tinned: no cold flow		N
4.10 (5.2.14)	Mains plug same protection	2 pole class II plug IP20	P
	Class III luminaire plug		N
4.10 (5.2.16)	Appliance inlets (IEC 60320)		N
	Appliance couplers of class II type		N



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IEC 60598-2-4 and/or EN 60598-2-4			
Clause	Requirement – Test	Result – Remark	Verdict
4.10 (5.2.17)	Non standardized interconnecting cables properly assembled		N
4.10 (5.2.18)	Used plug in accordance with:		—
	- IEC 60063		N
	- other standard	EN 50075	P
4.10 (5.3)	Internal wiring:		—
4.10 (5.3.1)	Internal wiring of suitable size and type	H03VH7-H, 0.5 mm <sup>2</sup>	P
	Through wiring:		—
	- not delivered/ mounting instruction		N
	- factory assembled		N
	- socket outlet loaded (A)..... :		N
	- temperatures ..... :	(see Annex 2)	N
	Green-yellow for earth only		N
4.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring:		—
	Cross-sectional area (mm <sup>2</sup> )..... :		N
	Insulation thickness		N
	Extra insulation added where necessary		N
4.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device:		—
	Adequate cross-sectional area and insulation thickness		N
4.10 (5.3.1.3)	Double or reinforced insulation for class II		P
4.10 (5.3.1.4)	Conductors without insulation		N
4.10 (5.3.1.5)	SELV current-carrying parts		N
4.10 (5.3.1.6)	Insulation thickness other than PVC or rubber		N
4.10 (5.3.2)	Sharp edges etc.:		—
	No moving parts of switches etc.		N
	Joints, raising/lowering devices		N
	Telescopic tubes etc.		N
	No twisting over 360°		N
4.10 (5.3.3)	Insulating bushings:		—
	- suitable fixed		N
	- material in bushings		N



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Clause	Requirement – Test	Result – Remark	Verdict
	- material not likely to deteriorate		N
	- cables with protective sheath		N
4.10 (5.3.4)	Joints and junctions effectively insulated		N
4.10 (5.3.5)	Strain on internal wiring		N
4.10 (5.3.6)	Wire carriers		N
4.10 (5.3.7)	Wire ends not tinned		P
	Wire ends tinned: no cold flow		N

<b>4.11 (8)</b>	<b>PROTECTION AGAINST ELECTRIC SHOCK</b>		—
4.11.1 (-)	Luminaires with BC cap		N
4.11 (8.2.1)	Live parts not accessible		P
	Basic insulated parts not used on the outer surface without appropriate protection		N
	Protection in any position		P
	Double-ended tungsten filament lamp		N
	Insulation lacquer not reliable		N
	Double-ended high pressure discharge lamp		N
	Relevant warning according to 3.2.18 fitted to the luminaire		N
4.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position		P
4.11 (8.2.3)	Class II luminaire:		—
	- basic insulated metal parts not accessible during starter or lamp replacement		N
	- basic insulation not accessible other than during starter or lamp replacement		P
	- glass protective shields not used as supplementary insulation		N
	Class I luminaire with BC lampholder		N
4.11 (8.2.4)	Portable luminaire:		—
	- protection independent of supporting surface		P
	- terminal block completely covered		N
4.11 (8.2.5)	Compliance with the standard test finger or relevant probe		P
4.11 (8.2.6)	Covers reliably secured		P



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Clause	Requirement – Test	Result – Remark	Verdict
4.11 (8.2.7)	Discharging of capacitors $\geq 0,5 \mu\text{F}$ :		—
	Portable plug connected luminaire with capacitor		N
	Other plug connected luminaire with capacitor		N
	Discharge device on or within capacitor		N
	Discharge device mounted separately		N
<b>4.12 (12)</b>	<b>ENDURANCE TEST AND THERMAL TEST</b>		—
4.12 (12.3)	Endurance test: HH-5A		—
	- mounting-position .....		—
	- test temperature ( $^{\circ}\text{C}$ ) .....	35 $^{\circ}\text{C}$	—
	- total duration (h) .....	240h	—
	- supply voltage: Un factor; calculated voltage (V) :	247.7V (at 1.05 times rated wattage)	—
	- lamp used .....	48V/3W	—
4.12 (12.3.2)	After endurance test:		—
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N
	- marking legible		P
	- no cracks, deformation etc.		P
4.12 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
4.12 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	N
4.12 (-)	Test overturned position (overturns < 15 $^{\circ}$ )		N
4.12 (12.6)	Thermal test (failed lamp control gear condition):		—
4.12 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A) .....		—
	- case of abnormal conditions.....		—
	- electronic lamp control gear		N
	- measured winding temperature ( $^{\circ}\text{C}$ ): at 1,1 Un .....		—
	- measured mounting surface temperature ( $^{\circ}\text{C}$ ) at 1,1 Un .....		N
	- calculated mounting surface temperature ( $^{\circ}\text{C}$ ) .....		N
	- track-mounted luminaires		N
4.12 (12.6.2)	Temperature sensing control:		—
	- case of abnormal conditions.....		—

IEC 60598-2-4 and/or EN 60598-2-4			
Clause	Requirement – Test	Result – Remark	Verdict
	- thermal link		N
	- manual reset cut-out		N
	- auto reset cut-out		N
	- measured mounting surface temperature (°C)..... :		N
	- track-mounted luminaires		N
4.12 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		—
4.12 (12.7.1)	Through wiring or looping-in wiring loaded by a current of (A)..... :		—
	- case of abnormal conditions..... :		—
	- measured winding temperature (°C): at 1,1 Un... :		—
	- measured temperature of fixing point/ exposed part (°C): at 1,1 Un..... :		N
	- calculated temperature of fixing point/ exposed part (°C)..... :		N
4.12 (12.7.2)	Temperature sensing control:		—
	- thermal link		N
	- manual reset cut-out		N
	- auto reset cut-out		N
	- measured temperature of fixing point/ exposed part (°C)..... :		N

<b>4.13 (9)</b>	<b>RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE</b>		—
4.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		—
	- classification according to IP..... :	IP20	—
	- mounting position during test..... :		—
	- fixing screws tightened; torque (Nm)..... :		—
	- tests according to clauses..... :	9.2.0	—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		N
	b) no talcum in dust-tight luminaire		N
	c) no trace of water on current-carrying parts or where it could become a hazard		N
	d) i) For luminaires without drain holes – no water entry		N
	d) ii) For luminaires with drain holes – no hazardous water entry		N
	e) no water in watertight luminaire		N
	f) no contact with live parts (IP2X)		P
	f) no entry into enclosure (IP3X and IP4X)		N



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Clause	Requirement – Test	Result – Remark	Verdict
	f) no contact with live parts (IP3X and IP4X)		N
4.13 (9.3)	Humidity test 48 h	25°C, 93% R.H.	P

IEC 60598-2-4 and/or EN 60598-2-4			
Clause	Requirement – Test	Result – Remark	Verdict
<b>4.14 (10)</b>	<b>INSULATION RESISTANCE AND ELECTRIC STRENGTH</b>		—
4.14 (10.2.1)	Insulation resistance test:		—
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø .....		—
	Insulation resistance (MΩ)		—
	SELV:		—
	- between current-carrying parts of different polarity .....		N
	- between current-carrying parts and mounting surface .....		N
	- between current-carrying parts and metal parts of the luminaire .....		N
	Other than SELV:		—
	- between live parts of different polarity .....	>2MΩ	P
	- between live parts and mounting surface .....	>4MΩ	P
	- between live parts and metal parts .....		N
	- between live parts of different polarity through action of a switch .....		N
4.14 (10.2.2)	Electric strength test:		—
	Dummy lamp		N
	Luminaires with ignitors after 24 h test		N
	Luminaires with manual ignitors		N
	Test voltage (V):		N
	SELV:		—
	- between current-carrying parts of different polarity .....		N
	- between current-carrying parts and mounting surface .....		N
	- between current-carrying parts and metal parts of the luminaire .....		N
	Other than SELV:		—
	- between live parts of different polarity .....	1480V	P
	- between live parts and mounting surface .....	3710V	P
	- between live parts and metal parts .....		N
	- between live parts of different polarity through action of a switch .....		N
4.14 (10.3.1)	Leakage current (mA) .....	<0.5mA	P



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Clause	Requirement – Test	Result – Remark	Verdict

<b>4.15 (13) RESISTANCE TO HEAT, FIRE AND TRACKING</b>			
4.15 (13.2.1)	Ball-pressure test:		—
	- part tested; temperature (°C).....:	Lampholder material, 125°C	P
4.15 (13.3.1)	Needle flame test (10 s):		—
	- part tested.....:	Lampholder material	P
	- part tested.....:	Candle stick enclosure	P
4.15 (13.3.2)	Glow-wire test (650 °C):		—
	- part tested.....:	Plastic stand and plastic covers	P
	- part tested.....:		N
4.15 (13.4.1)	Tracking test: part tested .....		N

<b>ZB ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)</b>			
(3.3)	DK: power supply cord with label		N
	IT: warning label on Class 0 luminaire		N
(4.5.1)	DK: socket-outlets		N
(5.2.1)	CY, DK, FI, SE, GB: type of plug	No CY and GB plug	N

<b>ZC ANNEX ZC, NATIONAL DEVIATIONS (EN)</b>			
4 & 5	FR: Socket-outlets 10/16A providing power to other appliances shall be shuttered		N
(13.3)	DK: Needle flame test during 30 s		N
(13.3)	GB: Requirements according to United Kingdom Building Regulation		N
(13.3.2)	FR: Glow-wire test 850 °C alt. 750 °C for luminaires in premises open to public or 960 °C for luminaires in emergency exits		N



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IEC 60598-2-4 and/or EN 60598-2-4			
Clause	Requirement – Test	Result – Remark	Verdict

ANNEX 1: components			
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object/part No.	code	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity
Mains Plug	B	Taizhou Xingda Package Material Co., Ltd	XD-1	250V~ 2.5A	VDE0620 EN 50075	VDE
Alternative Mains Plug	D	Yueqing Zhongxin Lamp Wire Co., Ltd	Z-001	250V~ 2.5A	EN 50075	TUV
	D	Pilot King	PK-001	250V~ 2.5A	VDE0620 EN 50075	VDE
	D	Zhejiang Jiaojiang General Festival Lights Joint Factory	JG-P5	250V~ 2.5A	VDE0620 EN 50075	VDE
	D	Zhejiang Jiaojiang General Festival Lights Joint Factory	JG-P8	250V~ 2.5A	VDE0620 EN 50075	KEMA
	D	Linhai Shuoda Electronics Co., Ltd	SD-001	250V~ 2.5A	VDE0620 EN 50075	VDE
	D	Luqiao Yuanguang	YG-01	250V~ 2.5A	VDE0620 EN 50075	VDE
Supply cord	B	Taizhou Xingda Package Material Co., Ltd	H03VVH2-F	300/300V 2x0.75mm <sup>2</sup>	VDE 0281- 8 HD21.8	VDE
Alternative supply cord	D	Yuyao Jingyi Electronic	H03VVH2-F	300/300V 2x0.75mm <sup>2</sup>	VDE 0281- 8 HD21.8	VDE
	D	Ningbo Qiaopu Electric Co., Ltd	H03VVH2-F	300/300V 2x0.75mm <sup>2</sup>	VDE 0281- 8 HD21.8	VDE
Internal wire	B	Taizhou Xingda Package Material Co., Ltd	H03VH7-H	300/300V 1x0.5mm <sup>2</sup>	VDE 0281- 8 HD21.8	VDE
Alternative internal wire	D	Yueqing Zhongxin Lamp Wire Co., Ltd	H03VH7-H	300/300V 1x0.5mm <sup>2</sup>	VDE 0281- 8 HD21.8	TUV
	D	Zhejiang Jiaojiang General Festival Lights Joint Factory	H03VH7-H	300/300V 1x0.5mm <sup>2</sup>	VDE 0281- 8 HD21.8	VDE
	D	Zhejiang Jiaojiang General Festival Lights Joint Factory	H03VH7-H	300/300V 1x0.5mm <sup>2</sup>	HD21.8	KEMA
	D	Taizhou Xingda Package Material Co., Ltd	H03VH7-H	300/300V 1x0.5mm <sup>2</sup>	HD21.8	KEMA
	D	Taizhou City Yuhong Light Decoration Co., Ltd.	H03VH7-H	300/300V 1x0.5mm <sup>2</sup>	VDE 0281- 8 HD21.8	VDE
Switch	B	Yueqing Xing Xiong Electronic Fittings Factory	303	AC250V, 2A	VDE 0630- 1 VDE 0630- 2-1	VDE

IEC 60598-2-4 and/or EN 60598-2-4						
Clause	Requirement – Test			Result – Remark		Verdict
Lampholder	C	Yueqing Huaheng	/	PP	EN 60598-1	Tested in the EUT
Bulb	C	Yueqing Huaheng	/	See model list	EN 60598-1	Tested in the EUT
Cord anchorage	C	Yueqing Huaheng	/	PVC	EN 60598-1	Tested in the EUT
Heat shrinking tube	C	Shenzhen Wore Heat Shrinkable Material Co., Ltd.	RSFR-x	600 V, T125, VW-1	UL 224	Tested in EUT/ UL (E203950)

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

IEC 60598-2-4 and/or EN 60598-2-4			
Clause	Requirement – Test	Result – Remark	Verdict

	<b>ANNEX 2: temperature measurements, thermal tests of Section 12</b>	
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	Type reference.....:	HH-5A	—
	Lamp used .....	48V/3W	—
	Lamp control gear used.....:	—	—
	Mounting position of luminaire .....	Stand on the test corner	—
	Supply wattage (W) .....	16W	—
	Supply current (A).....:	0.057A	—
	Calculated power factor .....	—	—
	Table: measured temperatures corrected for $t_a = 25\text{ }^\circ\text{C}$ :		P
	- abnormal operating mode .....	—	—
	- test 1: rated voltage .....	—	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage .....	247.7V (at 1.05 times rated wattage)	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage.....:	—	—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage .....	—	—
	Through wiring or looping-in wiring loaded by a current of (A) during the tests .....	—	—

IEC 60598-2-4 and/or EN 60598-2-4			
Clause	Requirement – Test	Result – Remark	Verdict

temperature (°C) of part	clause 12.4 – normal				clause 12.5 – abnormal	
	test 1	test 2	test 3	limits	test 4	limit
Supply cord near the cord anchorage	—	29	—	90	—	—
Surface of switch	—	28	—	55	—	—
Internal wire inside the lampholder	—	30	—	90	—	—
Lampholder in contact with the bulb	—	52	—	90	—	—
Outer enclosure of the lampholder near the bulb	—	37	—	90	—	—
Test corner (measured under the luminaire stand)	—	25	—	90	—	—

IEC 60598-2-4 and/or EN 60598-2-4			
Clause	Requirement – Test	Result – Remark	Verdict

	<b>ANNEX 3: screw terminals (part of the luminaire)</b>		—
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(14)	<b>SCREW TERMINALS</b>		N
(14.2)	Type of terminal .....		—
	Rated current (A) .....		—
(14.3.2.1)	One or more conductors		N
(14.3.2.2)	Special preparation		N
(14.3.2.3)	Terminal size		N
	Cross-sectional area (mm <sup>2</sup> ) .....		N
(14.3.3)	Conductor space (mm) .....		N
(14.4)	Mechanical tests		N
(14.4.1)	Minimum distance		N
(14.4.2)	Cannot slip out		N
(14.4.3)	Special preparation		N
(14.4.4)	Nominal diameter of thread (metric ISO thread) ... :	M	N
	External wiring		N
	No soft metal		N
(14.4.5)	Corrosion		N
(14.4.6)	Nominal diameter of thread (mm) .....		N
	Torque (Nm) .....		N
(14.4.7)	Between metal surfaces		N
	Lug terminal		N
	Mantle terminal		N
	Pull test; pull (N) .....		N
(14.4.8)	Without undue damage		N

IEC 60598-2-4 and/or EN 60598-2-4			
Clause	Requirement – Test	Result – Remark	Verdict

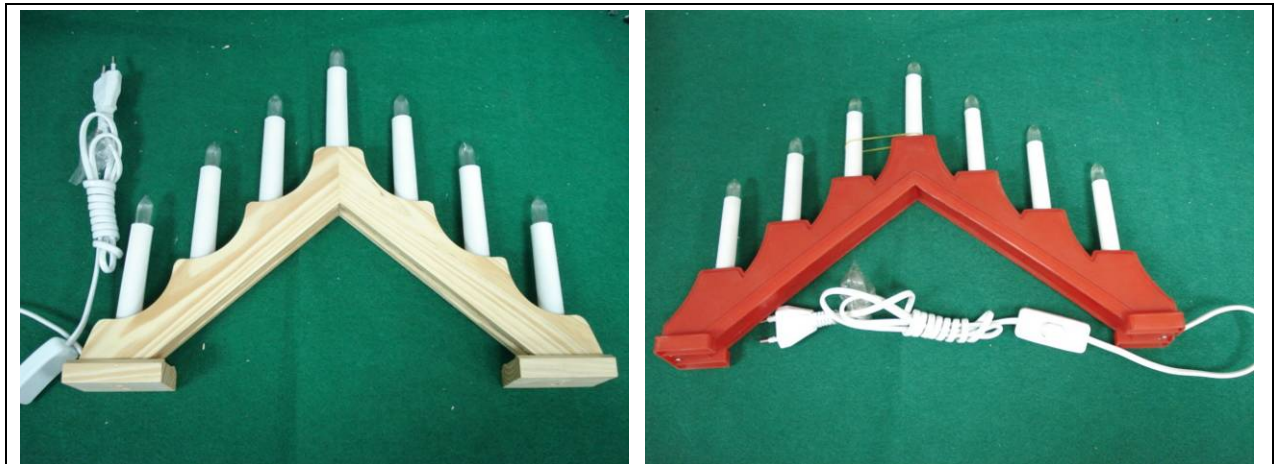
	<b>ANNEX 4: screwless terminals (part of the luminaire)</b>		—
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(15)	<b>SCREWLESS TERMINALS</b>		N
(15.2)	Type of terminal .....		—
	Rated current (A) .....		—
(15.3.1)	Material		N
(15.3.2)	Clamping		N
(15.3.3)	Stop		N
(15.3.4)	Unprepared conductors		N
(15.3.5)	Pressure on insulating material		N
(15.3.6)	Clear connection method		N
(15.3.7)	Clamping independently		N
(15.3.8)	Fixed in position		N
(15.3.10)	Conductor size		N
	Type of conductor		N
(15.5.1)	Terminals internal wiring		N
(15.5.1.1)	Pull test spring-type terminals (4 N, 4 samples)		N
(15.5.1.2)	Pull test pin or tab terminals (4 N, 4 samples)		N
	Insertion force not exceeding 50 N		N
(15.5.2)	Permanent connections: pull-off test (20 N)		N
(15.6)	Electrical tests		N
	Voltage drop (mV) after 1 h (4 samples) .....		N
	Voltage drop of two inseparable joints		N
	Number of cycles .....		—
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples) .....		N
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples) .....		N
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples).....		N
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples).....		N
(15.7)	Terminals external wiring		N
	Terminal size and rating		N
(15.8.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) .....		N
	Pull test pin or tab terminals or welded connections (4 samples); pull (N) .....		N
(15.9)	Contact resistance test		N

IEC 60598-2-4 and/or EN 60598-2-4											
Clause	Requirement – Test					Result – Remark					Verdict
	Voltage drop (mV) after 1 h										
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Voltage drop of two inseparable joints										
	Voltage drop after 10th alt. 25th cycle										
	Max. allowed voltage drop (mV) .....										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Voltage drop after 50th alt. 100th cycle										
	Max. allowed voltage drop (mV) .....										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Continued ageing: voltage drop after 10th alt. 25th cycle										
	Max. allowed voltage drop (mV) .....										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Continued ageing: voltage drop after 50th alt. 100th cycle										
	Max. allowed voltage drop (mV) .....										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											

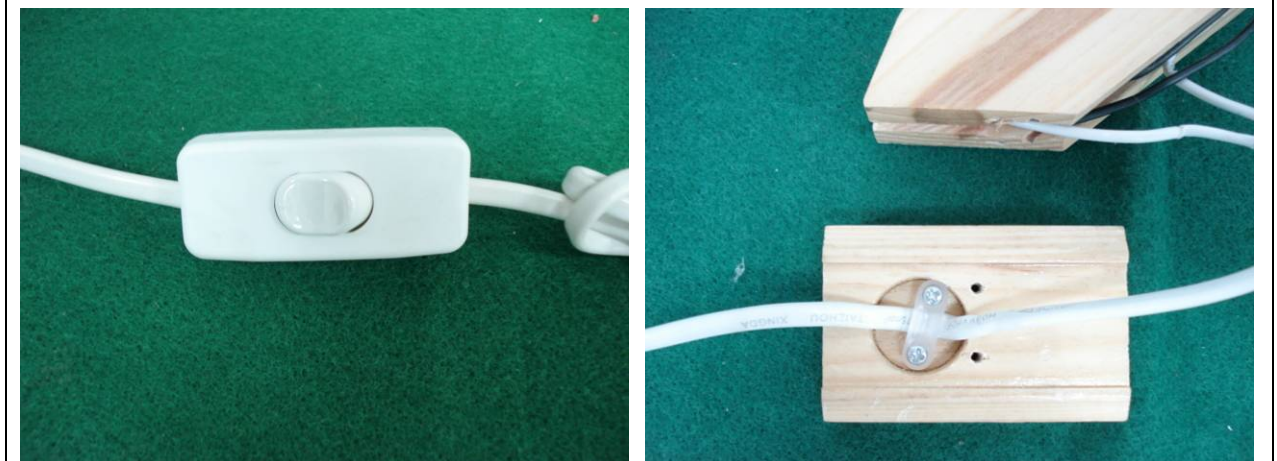
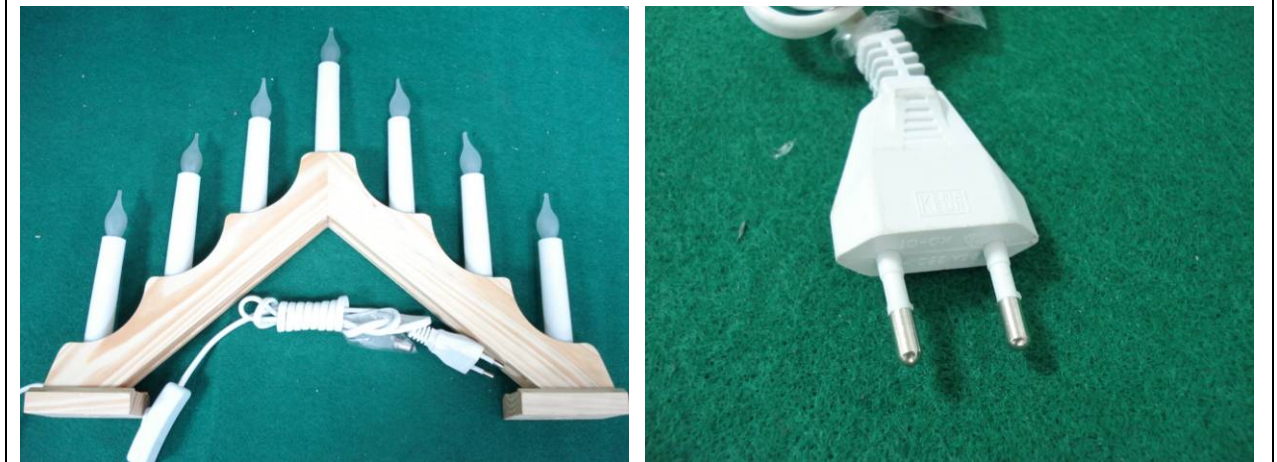
IEC 60598-2-4 and/or EN 60598-2-4			
Clause	Requirement – Test	Result – Remark	Verdict

	<b>ANNEX 5: Pictures</b>		—
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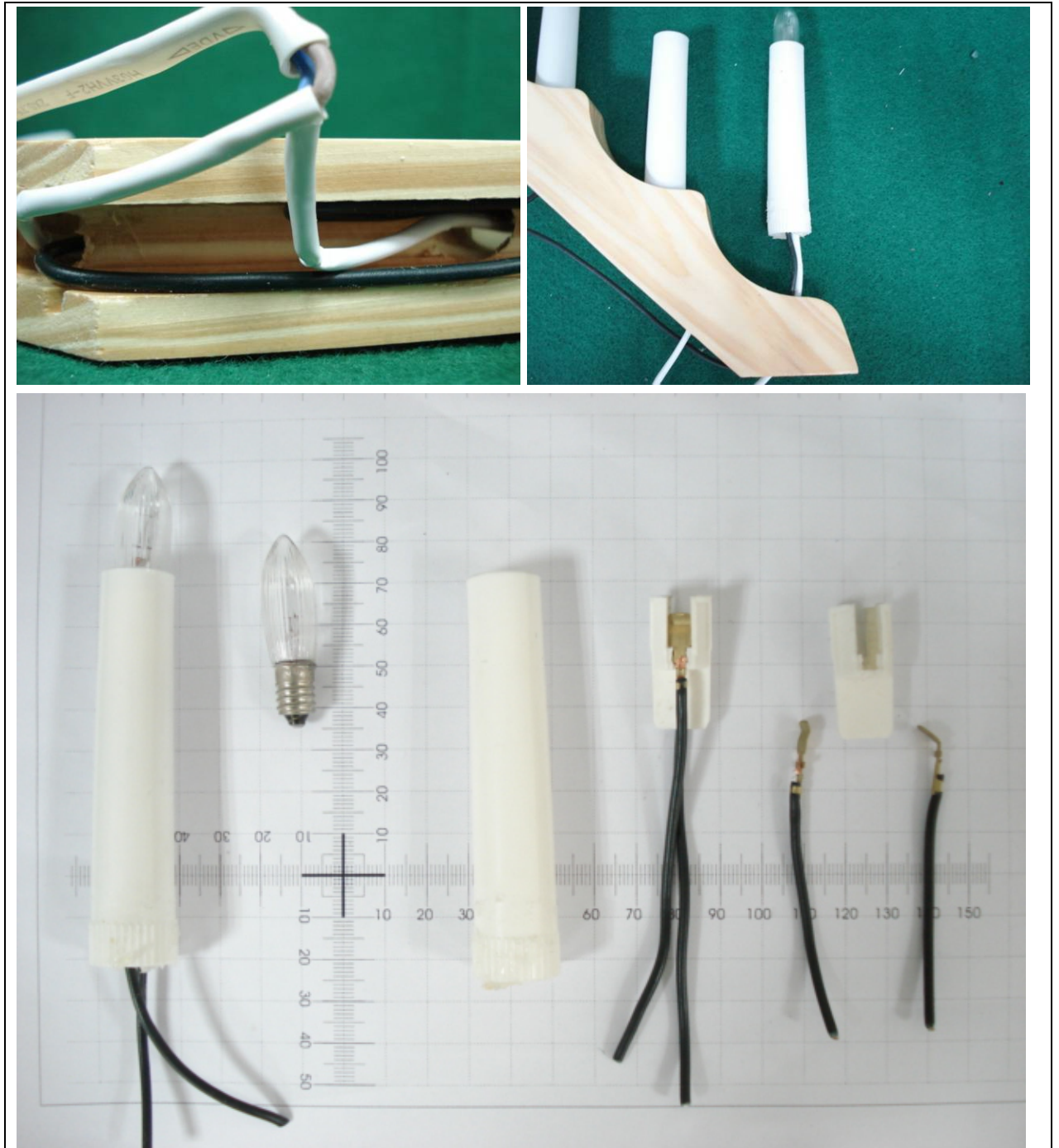
HH-7A

HH-7AP



IEC 60598-2-4 and/or EN 60598-2-4			
Clause	Requirement – Test	Result – Remark	Verdict

ANNEX 5: Pictures (continued)			—
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IEC 60598-2-4 and/or EN 60598-2-4			
Clause	Requirement – Test	Result – Remark	Verdict

	<b>ANNEX 6: User manual</b>		—
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**User Manual:**

Dekorative Tischleuchte HH-5A, 220-240V ~, 50Hz, 15W  
5 Lampen: 48V/3W

**Sicherheitshinweise**

1. Vor Anschluss an das Stromnetz den Artikel vollständig aus der Verpackung nehmen.
2. Stellen Sie sicher, dass alle Fassungen mit einer Lampe bestückt sind und weder die Leuchte, die Lampen, der Schalter noch das Anschlusskabel und der Netzstecker beschädigt sind.
3. Zum Lampenwechsel muss folgendes beachtet werden:  
Ziehen Sie den Netzstecker.  
Ersetzen Sie nun das Leuchtmittel. Achten Sie auf korrekten Sitz der Lampe in der Fassung.
4. Diese Leuchte ist nur für die Benutzung in Innenräumen geeignet.
5. Defekte Lampen müssen umgehend durch Lampen mit gleicher Spannungs- und Leistungsangabe ersetzen, um unzulässige Erwärmung zu vermeiden !
6. Es sind nur Ersatzlampen der gleichen Sorte zu verwenden, die mit dieser Leuchte zur Verfügung gestellt werden !
7. Die Isolierung der Fassung, sowie die Anschlussleitung oder des Schalters darf nicht beschädigt werden. Eine beschädigte Anschlussleitung kann nicht ersetzt werden. Wenn die Anschlussleitung beschädigt ist, darf die Leuchte nicht mehr benutzt werden und muss entsorgt werden.
8. Diese Leuchte ist kein Spielzeug. Betreiben Sie die Leuchte nicht in Kinderzimmern, lassen Sie Kinder nicht unbeaufsichtigt in der Nähe der Leuchte. Bewahren Sie die Leuchte fuer Kinder unzugänglich auf.
9. Die Glühlampen können sehr heiss werden. Achten Sie unbedingt darauf, dass die Glühlampen nicht in direkten Kontakt mit brennbaren Materialien wie z. B. Vorhang, Weihnachtsbaum, Dekorationsartikel oder ähnliches kommen können.
10. Diese Leuchte darf nicht elektrisch mit anderen Leuchten oder Lichterketten verbunden werden!
11. Entsorgen Sie die Leuchte nicht über den Hausmüll. In diesem Gerät sind wiederverwendbare Wertstoffe enthalten. Ihre örtliche Gemeindeverwaltung nennt Ihnen gerne die öffentlichen Sammelstellen für Elektro-Altgeräte



**Packing:**

Sundar Lighting Co., Ltd  
Typ: HH-5A  
220-240V ~ 50Hz 15W  
5 Lampen: 48V/3W



1. Vor dem Lampenwechsel Netzstecker ziehen !
2. Nur zur Verwendung in Innenräumen !
3. Die Leuchte nicht anschliessen, solange sie in der Verpackung ist.
4. Es sind nur Ersatzlampen der gleichen Sorte zu verwenden, die mit dieser Leuchte zur Verfügung gestellt werden !



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Report No. 85290

IEC 60598-2-4 and/or EN 60598-2-4			
Clause	Requirement – Test	Result – Remark	Verdict



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	<b>ANNEX 7: Additional requirements of EN 60598-2-20 (only relevant clauses which are not covered by EN 60598-2-4 are considered)</b>		—
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<b>20.6 (4)</b>	<b>CONSTRUCTION</b>		—
20.6 (4.2)	Components replaceable without difficulty		N
20.6 (4.3)	Wire ways smooth and free from sharp edges		P
20.6 (4.4)	Lampholders comply with IEC/EN 60238 or IEC/EN 61184	E10	P
20.6 (4.10.1)	No contact, mounting surface - accessible metal parts - wiring of basic insulation		P
20.6 (4.10.3)	Retention of insulation:		—
	- fixed		N
	- unable to be replaced; luminaire inoperative		P
20.6 (4.11)	Electrical connections		N
20.6 (4.11.4)	Material of current-carrying parts		P
20.6 (4.11.5)	No contact to wood		P
20.6 (4.13)	Mechanical strength		—
20.6.6 (-)	Lampholders comply with IEC/EN 60238	E10	P
	E5 and E10 and similar small lampholder of push-in type (EN)		P
20.6 (4.13.1)	Impact tests:		—
	- fragile parts; energy (Nm).....:		N
	- other parts; energy (Nm) .....	Lampholder. 0.5 Nm	P
	1) live parts		P
	2) linings		N
	3) protection		P
	4) covers		N
20.6 (4.13.3)	Straight test finger		P
20.6 (4.13.6)	Tumbling barrel	50 falls of 500mm	P
Max. 48V	Rated voltage (V)		P
Max. 30W	Rated wattage (W)		P
See Annex 2	Filament bridges within the lamps		P

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<b>20.10 (5)</b>	<b>EXTERNAL AND INTERNAL WIRING</b>		—
<b>20.10 (5.2)</b>	<b>Supply connection and external wiring</b>		
20.10 (5.3)	Internal wiring		—
20.10 (5.3.1)	Internal wiring of suitable size and type	H03VH7-H; 0,5 mm <sup>2</sup>	P
20.10 (5.3.1.3)	Double or reinforced insulation for class II		P
20.10 (5.3.4)	Joints and junctions effectively insulated		P
20.10 (5.3.5)	Strain on internal wiring		N
20.10 (5.3.7)	Wire ends not tinned		P
	Wire ends tinned: no cold flow		N