

TEST REPORT
EN 60598-2-1
Luminaires
Part 2: Particular requirements
Section One – Fixed general purpose luminaires

Report

Reference No. : R/L16/OP/444
Tested by (+ signature) : Bogusław Strzała
Approved by (+ signature) : Dariusz Foryś
Date of issue : 29.09.2016
Contents : 26 pages
..... :



Testing laboratory

Name : LABEL s.c.
Address : 51-126 Wrocław, ul. Milicka 71
Testing location : as above

Client

Name : MATER A/S
Address : Virumgaardsvej 25
..... : 2830 Virum, Denmark

Test specification

Standard : EN 60598-2-1:1989
(see also EN 60598-1:2015)
Test procedure : TYPE TEST
Procedure deviation : N.A.
Non-standard test method : N.A.
.....

Test item

Description : Fixed luminaires
Trademark :
Model and/or type reference : 02501 ÷ 02509
Different models of luminaires have different colors
Series :

Manufacturer : MATER A/S
Ratings : 1 x MAX 3,5W / LED, G9, 230V / 50Hz
Lamp identification : 3,5W / G9 LED

Test case verdicts

Test case does not apply to the test object : N.A.
 Test item does meet the requirement : Pass
 Test item does not meet the requirement : Fail
 :

Testing

Date of receipt of test item : Aug. 2, 2016
 Date(s) of performance of test : Aug. 4, 2016 - Sept. 29, 2016
 :

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.



Clause numbers between brackets refer to clauses in IEC 598-1 (EN 60598-1).

“(see remark #)” refers to a remark appended to the report.

“(see Annex #)” refers to a table appended to the report.

Throughout this report a comma is used as decimal separator.

Copy of marking plate

mater 230V~ | MAX 3.5W
OPISNY CRAFTSMANSHIP SINCE 1888 LED | G9
 Virumgaardsvvej 25
 2830 Virum
 Denmark  
 ARTICLE NUMBER 02501

mater max 3.5 W
 LED, G9

EN 60598-2-1			
Clause	Requirement – Test	Result - Remark	Verdict
1.1 (0)	SCOPE		
1.1 (0.2)	More sections applicable	No	—
1.4 (2)	CLASSIFICATION		
1.4 (2.2)	Type of protection	Class II	—
1.4 (2.3)	Degree of protection	IP 20	—
1.4 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces	Yes	—
	Luminaire not suitable for direct mounting on normally flammable surfaces	No	—
1.4 (2.5)	Luminaire for normal use	Yes	—
	Luminaire for rough service	No	—
1.5 (3)	MARKING		
1.5 (3.2)	Mandatory markings		Pass
	Position of the marking		Pass
	Format of the marking		Pass
1.5 (3.3)	Additional information		N.A.
	Language of instructions		N.A.
1.5 (3.3.1)	Combination luminaires		N.A.
1.5 (3.3.2)	Nominal frequency in Hz		N.A.
1.5 (3.3.3)	Operating temperature		N.A.
1.5 (3.3.4)	Symbol or warning notice		N.A.
1.5 (3.3.5)	Wiring diagram		N.A.
1.5 (3.3.6)	Special conditions		N.A.
1.5 (3.3.7)	Metal halide lamp luminaire - warning		N.A.
1.5 (3.3.8)	Limitation for semi-luminaires		N.A.
1.5 (3.3.9)	Power factor and supply current		N.A.
1.5 (3.3.10)	Suitability for use indoors		N.A.
1.5 (3.3.11)	Luminaires with remote control		N.A.
1.5 (3.3.12)	Clip-mounted luminaire - warning		N.A.
1.5 (3.3.13)	Specifications of protective shields		N.A.
1.5 (3.3.14)	Symbol for nature of supply		Pass

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Clause	Requirement – Test	Result - Remark	Verdict
1.5 (3.3.15)	Rated current of socket-outlet		N.A.
1.5 (3.3.16)	Rough service luminaire		N.A.
1.5 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments		N.A.
1.5 (3.3.18)	Non-ordinary luminaires with PVC cable		N.A.
1.5 (3.3.19)	Protective conductor current in instruction if applicable		N.A.
1.5 (3.3.20)	Provided with information if not intended to be mounted within arms reach		N.A.
1.5 (3.3.21)	Luminaires with non replaceable and non-user replaceable light source		N.A.
1.5 (3.3.22)	Controllable luminaires		N.A.
1.5 (3.4)	Test with water		Pass
	Test with hexane		Pass
	Legible after test		Pass
	Label attached		Pass

1.6 (4)	CONSTRUCTION		
1.6 (4.2)	Components replaceable without difficulty		N.A.
1.6 (4.3)	Wireways smooth and free from sharp edges		Pass
1.6 (4.4)	Lampholders		
1.6 (4.4.1)	Integral lampholder		N.A.
1.6 (4.4.2)	Wiring connection		N.A.
1.6 (4.4.3)	Lampholder for end to end mounting		N.A.
1.6 (4.4.4)	Positioning		N.A.
1.6 (4.4.5)	Peak pulse voltage		N.A.
1.6 (4.4.6)	Centre contact		N.A.
1.6 (4.4.7)	Parts in rough service luminaires resistant to tracking		N.A.
1.6 (4.4.8)	Lamp connectors		N.A.
1.6 (4.4.9)	Caps and bases correctly used		N.A.
1.6 (4.5)	Starter holders		
	Starter holder in luminaires other than Class II		N.A.
	Starter holder Class II construction		N.A.
1.6 (4.6)	Terminal blocks		
	Tails		N.A.
	Unsecured blocks		N.A.
1.6 (4.7)	Terminals and supply connections		
1.6 (4.7.1)	Contact to metal parts	Class II construction	N.A.
1.6 (4.7.2)	8 mm test live conductor		Pass
	8 mm test earth conductor		N.A.

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Clause	Requirement – Test	Result - Remark	Verdict
1.6 (4.7.3)	Terminals for supply conductors		Pass
1.6 (4.7.3.1)	Welded connections:		
	- stranded or solid conductor		N.A.
	- spot welding		N.A.
	- welding between wires		N.A.
	- type Z attachment		N.A.
	- mechanical test according to 15.8.2		N.A.
	- electrical test according to 15.9		N.A.
	- heat test according to 15.9.2.3 and 15.9.2.4		N.A.
1.6 (4.7.4)	Terminals other than supply connection	Lampholder terminals	Pass
1.6 (4.7.5)	Heat-resistant wiring/sleeves		N.A.
1.6 (4.7.6)	Multi-pole plug		N.A.
1.6 (4.8)	Switches		
	- adequate rating		N.A.
	- adequate fixing		N.A.
	- polarized supply		N.A.
	- compliance with 61058-1 for electronic switches		N.A.
1.6 (4.9)	Insulating lining and sleeves		
1.6 (4.9.1)	Retainment		Pass
	Method of fixing	heat shrinkable tubing	Pass
1.6 (4.9.2)	Insulated linings and sleeves		
	Resistant to a temperature > 20 °C to the wire temperature or		Pass
	a) and c) insulation resistance and electric strength		N.A.
	b) Ageing test. Temperature (°C)		N.A.
1.6 (4.10)	Insulation of Class II luminaires		
1.6 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		Pass
	Safe installation fixed luminaires		Pass
	Capacitors and switches		N.A.
	Interference suppression capacitors according to IEC 60384-14		N.A.
1.6 (4.10.2)	Assembly gaps:		
	- not coincidental		Pass
	- no straight access with test probe		Pass
	- degree of protection		Pass

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Clause	Requirement – Test	Result - Remark	Verdict
1.6 (4.10.3)	Retainment of insulation:		
	- fixed		Pass
	- unable to be replaced; luminaire inoperative		Pass
	- sleeves retained in position		Pass
	- lining in lampholder		Pass
1.6 (4.11)	Electrical components		
1.6 (4.11.1)	Contact pressure		Pass
1.6 (4.11.2)	Screws:		
	- self-tapping screws		N.A.
	- thread-cutting screws		N.A.
1.6 (4.11.3)	Screw locking:		
	- spring washer		N.A.
	- rivets		N.A.
1.6 (4.11.4)	Material of current-carrying parts		Pass
1.6 (4.11.5)	No contact to wood or mounting surface		N.A.
1.6 (4.11.6)	Electro-mechanical contact system		N.A.
1.6 (4.12)	Mechanical connections and glands		
1.6 (4.12.1)	Screws not made of soft metal		Pass
	Screws of insulating material		N.A.
	Torque test: torque (Nm): part		N.A.
	Torque test: torque (Nm): part		N.A.
	Torque test: torque (Nm): part		N.A.
1.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N.A.
1.6 (4.12.4)	Locked connections		
	- fixed arms; torque (Nm)		N.A.
	- lampholder; torque (Nm)		N.A.
	- push-button switches; torque 0,8 Nm		N.A.
1.6 (4.12.5)	Screwed glands; force (N)		N.A.
1.6 (4.13)	Mechanical strength		
1.6 (4.13.1)	Impact tests:		
	- fragile parts; energy (Nm)		N.A.
	- other parts; energy (Nm)	0,35	Pass
	1) live parts		Pass
	2) linings		N.A.
	3) protection		Pass
	4) covers		N.A.
1.6 (4.13.3)	Straight test finger		Pass

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Clause	Requirement – Test	Result - Remark	Verdict
1.6 (4.13.4)	Rough service luminaires		
	- IP54 or higher		N.A.
	a) fixed		N.A.
	b) hand-held		N.A.
	c) delivered with a stand		N.A.
	d) for temporary installations and suitable for mounting on a stand		N.A.
1.6 (4.13.6)	Tumbling barrel		N.A.
1.6 (4.14)	Suspensions and adjusting devices		
1.6 (4.14.1)	Mechanical load:		
	A) four times the weigh		Pass
	B) torque 2,5 Nm		N.A.
	C) bracket arm; bending moment (Nm)		N.A.
	D) load track-mounted luminaires		N.A.
	E) clip-mounted luminaires, glass-shelve; thickness (mm)		N.A.
	Metal rod; diameter (mm)		N.A.
	Fixed luminaire or independent control gear without fixing devices		N.A.
1.6 (4.14.2)	Load to flexible cables		
	Mass (kg)	≤ 0,650 kg	Pass
	Stress in conductors (N/mm ²)	less then 15 N/mm ²	Pass
	Semi-luminaires – mass (kg)		N.A.
	Semi-luminaires – bending moment (Nm) .. .:		N.A.
1.6 (4.14.3)	Adjusting devices:		
	- flexing test; numbers of cycles		N.A.
	- strands broken		N.A.
	- electric strength test afterwards	(see 10.2)	N.A.
1.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N.A.
1.6 (4.14.5)	Guide pulleys		N.A.
1.6 (4.14.6)	Strain on socket-outlets		N.A.

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Clause	Requirement – Test	Result - Remark	Verdict
1.6 (4.15)	Flammable materials:		
	- glow-wire test 650°C		N.A.
	- spacing \geq 30 mm		N.A.
	- screen withstanding test of 13.3.1		N.A.
	- screen dimensions		N.A.
	- no fiercely burning material		N.A.
	- thermal protection		N.A.
	- electronic circuits exempted		N.A.
1.6 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		
	a) construction		N.A.
	b) temperature sensing control		N.A.
	c) surface temperature		N.A.
1.6 (4.16)	Luminaires for mounting on normally flammable surfaces		
	No lamp control gear	(compliance with Section 12)	Pass
1.6 (4.16.1)	Lamp control gear spacing:		
	- spacing 35 mm		N.A.
	- spacing 10 mm		N.A.
1.6 (4.16.2)	Thermal protection:		
	- in lamp control gear		N.A.
	- external		N.A.
	- fixed position		N.A.
	- temperature marked lamp control gear		N.A.
1.6 (4.16.3)	Design to satisfy the test of 12.6	(see 12.6)	N.A.
1.6 (4.17)	Drain holes		N.A.
	Clearance at least 5 mm		N.A.
1.6 (4.18)	Resistance to corrosion:		
1.6 (4.18.1)	- rust-resistance		N.A.
1.6 (4.18.2)	- season cracking in copper		N.A.
1.6 (4.18.3)	- corrosion of aluminium		N.A.
1.6 (4.19)	Igniters compatible with ballast		N.A.
1.6 (4.20)	Rough service vibration		N.A.
1.6 (4.21)	Protective shield:		
1.6 (4.21.1)	Shield fitted		N.A.
	Shield of glass if tungsten halogen lamps		N.A.
1.6 (4.21.2)	Particles from a shattering lamp cannot impair safety		N.A.
1.6 (4.21.3)	No direct path		N.A.

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Clause	Requirement – Test	Result - Remark	Verdict
1.6 (4.21.4)	Impact test on shield		N.A.
	Glow-wire test on lamp compartment		N.A.
1.6 (4.22)	Attachments to lamps		N.A.
1.6 (4.23)	Semi-luminaires comply class II		N.A.
1.6 (4.24)	Photobiological hazards		N.A.
1.6 (4.25)	Mechanical hazard		Pass
1.6 (4.26)	Short circuit protection		
1.6 (4.26.1)	Uninsulated accessible SELV parts		N.A.
1.6 (4.26.2)	Short-circuit test		N.A.
1.6 (4.26.3)	Test chain according to Figure 29		N.A.
1.6 (4.27)	Terminal blocks with integrated screwless earthing contacts		N.A.
1.6 (4.28)	Fixing of thermal sensing controls		N.A.
1.6 (4.29)	Luminaire with non replaceable light source		N.A.
1.6 (4.30)	Luminaire with non-user replaceable light source		N.A.
1.6 (4.31)	Insulation between circuits		N.A.
1.6 (4.32)	Overvoltage protective devices		N.A.

1.7 (11)	CREEPAGE DISTANCES AND CLEARANCES		
	Class of protection	Class II	—
	Working voltage (V)	230 V	—
	Voltage from	Sinusoidal	—
	PTI	< 600	—
	Impulse withstand category (Normal category II) (Category III Annex U)	Category II	—
	Rated pulse voltage (kV)		—
	(1) Current-carrying parts of different polarity: cr (mm); cl (mm)		Pass
	(2) Current-carrying parts and accessible parts: cr (mm); cl (mm)		Pass
	(3) Parts becoming live due to breakdown of basic insulation and metal parts: cr (mm); cl (mm)		N.A.
	(4) Outer surface of cable where it is clamped and metal parts: cr (mm); cl (mm) :		N.A.
	(5) Not used		N.A.
	(6) Current-carrying parts and supporting surface: cr (mm); cl (mm)		Pass

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Clause	Requirement – Test	Result - Remark	Verdict
1.8 (7)	PROVISION FOR EARTHING		
1.8 (7.2.1 + 7.2.3)	Accessible metal parts		N.A.
	Metal parts in contact with supporting surface		N.A.
	Resistance < 0,5 Ω		N.A.
	Self-tapping screws used		N.A.
	Thread-forming screws		N.A.
	Thread-forming screw used in a groove		N.A.
	Earth makes contact first		N.A.
1.8 (7.2.2 + 7.2.3)	Earth continuity in joints etc.		N.A.
1.8 (7.2.4)	Locking of clamping means		N.A.
	Compliance with 4.7.3		N.A.
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N.A.
1.8 (7.2.5 + 7.2.9)	Earth terminal integral part of connector socket		N.A.
1.8 (7.2.6 + 7.2.9)	Earth terminal adjacent to mains terminals		N.A.
1.8 (7.2.7 + 7.2.9)	Electrolytic corrosion of the earth terminal		N.A.
1.8 (7.2.8 + 7.2.9)	Material of earth terminal		N.A.
	Contact surface bare material		N.A.
1.8 (7.2.10)	Class II luminaire for looping-in		N.A.
	Double or reinforced insulation to functional earth		N.A.
1.8 (7.2.11)	Earthing core coloured green-yellow		N.A.
	Length of earth conductor		N.A.
1.9 (14)	SCREW TERMINALS		
	Separately approved; component list	(Terminal block - see Annex 1)	Pass
	Part of the luminaire	(see Annex 3)	N.A.
1.9 (15)	SCREWLESS TERMINALS		
	Separately approved; component list	(Lampholder - see Annex 1)	Pass
	Part of the luminaire	(see Annex 4)	N.A.

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Clause	Requirement – Test	Result - Remark	Verdict
1.10 (5)	EXTERNAL AND INTERNAL WIRING		
1.10 (5.2)	Supply connections and external wiring		
1.10 (5.2.1 + 5.2.4)	Means of connection	terminal blocks	Pass
1.10 (5.2.2 + 5.2.4)	Type of cable		N.A.
	Nominal cross-sectional area (mm ²)		N.A.
1.10 (5.2.3 + 5.2.4)	Type of attachment, X, Y or Z		N.A.
1.10 (5.2.5)	Type Z not connected to screws		N.A.
1.10 (5.2.6)	Cable entries:		
	- suitable for introduction		N.A.
	- adequate degree of protection		N.A.
1.10 (5.2.7)	Cable entries through rigid material have rounded edges		N.A.
1.10 (5.2.8)	Insulating bushings:		
	- suitably fixed		N.A.
	- material in bushings		N.A.
	- material not likely to deteriorate		N.A.
	- tubes or guards made of insulating material		N.A.
1.10 (5.2.9)	Locking of screwed bushings		N.A.
1.10 (5.2.10)	Cord anchorage:		
	- covering protected from abrasion		N.A.
	- clear how to be effective		N.A.
	- no mechanical or thermal stress		N.A.
	- no tying of cables into knots etc.		N.A.
	- insulating material or lining		N.A.
1.10 (5.2.10.1)	Cord anchorage for type X attachment:		
	a) at least one part fixed		N.A.
	b) types of cable		N.A.
	c) no damaging of cable		N.A.
	d) whole cable can be mounted		N.A.
	e) no touching of clamping screws		N.A.
	f) metal screw not directly on cable		N.A.
	g) replacement without special tool		N.A.
	Glands not used as anchorage		N.A.
	Labyrinth type anchorages		N.A.

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Clause	Requirement – Test	Result - Remark	Verdict
1.10 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		N.A.
1.10 (5.2.10.3)	Tests:		
	- impossible to push cable; unsafe		N.A.
	- pull test: 25 times; pull (N)		N.A.
	- torque test: torque (Nm)		N.A.
	- displacement ≤ 2 mm		N.A.
	- no movement of conductors		N.A.
	- no damage of cable or cord		N.A.
1.10 (5.2.11)	External wiring passing into luminaire		N.A.
1.10 (5.2.12)	Looping in terminals		N.A.
1.10 (5.2.13)	Wire ends not tinned		N.A.
	Wire ends tinned: no cold flow		N.A.
1.10 (5.2.14)	Mains plug same protection		N.A.
	Class III luminaire plug		N.A.
1.10 (5.2.15)	Not used		N.A.
1.10 (5.2.16)	Appliance inlets (IEC 60320)		N.A.
	Appliance couplers of class II type		N.A.
1.10 (5.2.17)	No standardized interconnecting cables properly assembled		N.A.
1.10 (5.2.18)	Used plug in accordance with		
	- IEC 60083		N.A.
	- other standard		N.A.
1.10 (5.3)	Internal wiring		
1.10 (5.3.1)	Internal wiring of suitable size and type	H03VVH2-F 2x0,75mm ²	Pass
	Through wiring		
	- not delivered/ mounting instruction		N.A.
	- factory assembled		N.A.
	- socket outlet loaded (A)		N.A.
	- temperatures	(see Annex 2)	N.A.
	Green-yellow for earth only		N.A.
1.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		
	Cross-sectional area (mm ²)	2 x 0,75 (In<2A)	Pass
	Insulation thickness (mm)	> 0,5 PVC (In<2A)	Pass
	Extra insulation added where necessary		N.A.
1.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		
	Adequate cross-sectional area and insulation thickness		N.A.

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Clause	Requirement – Test	Result - Remark	Verdict
1.10 (5.3.1.3)	Double or reinforced insulation for class II		Pass
1.10 (5.3.1.4)	Conductors without insulation		N.A.
1.10 (5.3.1.5)	SELV current-carrying parts		N.A.
1.10 (5.3.1.6)	Insulation thickness other than PVC or rubber		N.A.
1.10 (5.3.2)	Sharp edges etc.		Pass
	No moving parts of switches etc.		N.A.
	Joints, raising/lowering devices		N.A.
	Telescopic tubes etc.		N.A.
	No twisting over 360°		N.A.
1.10 (5.3.3)	Insulating bushings:		
	- suitable fixed	Heat shrinkable tubing	Pass
	- material in bushings		Pass
	- material not likely to deteriorate		Pass
	- cables with protective sheath		Pass
1.10 (5.3.4)	Joints and junctions effectively insulated		N.A.
1.10 (5.3.5)	Strain on internal wiring		Pass
1.10 (5.3.6)	Wire carriers		N.A.
1.10 (5.3.7)	Wire ends not tinned		N.A.
	Wire ends tinned: no cold flow		Pass
1.11 (8)	PROTECTION AGAINST ELECTRIC SHOCK		
1.11 (8.2.1)	Live parts not accessible with standard test finger		Pass
	Basic insulated parts not used on the outer surface without appropriate protection		N.A.
	Basic insulated parts not accessible with standard test finger on portable and adjustable luminaires		N.A.
	Basic insulated parts not accessible with Ø 50 mm probe from outside, within arms reach, on wall-mounted luminaires		N.A.
	Lamp and starterholders in portable and adjustable luminaires comply with double or reinforced insulation requirements		N.A.
	Basic insulation only accessible under lamp or starter replacement		N.A.
	Protection in any position		Pass
	Insulation lacquer not reliable		N.A.
	Double-ended tungsten filament lamp		N.A.
	Double-ended high pressure discharge lamp		N.A.
	Relevant warning according to 3.2.18 fitted to the luminaire		N.A.

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Clause	Requirement – Test	Result - Remark	Verdict
1.1 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N.A.
1.11 (8.2.3)	Class II luminaire		
	- basic insulated metal parts not accessible during starter or lamp replacement		Pass
	- basic insulation not accessible other than during starter or lamp replacement		Pass
	- glass protective shields not used as supplementary insulation		N.A.
1.11 (8.2.3)	BC lampholder of metal in class I luminaires shall be earthed		N.A.
1.11 (8.2.3c)	Class III luminaires with exposed SELV parts:		N.A.
	Ordinary luminaire:		
	- touch current		N.A.
	- no-load voltage		N.A.
	Other than ordinary luminaire:		
	- nominal voltage		N.A.
1.11 (8.2.4)	Portable luminaire:		
	- protection independent of supporting surface		N.A.
1.11 (8.2.5)	Compliance with the standard test finger or relevant probe		Pass
1.11 (8.2.6)	Covers reliably secured		N.A.
1.11 (8.2.7.)	Discharging of capacitors $\geq 0,5 \mu\text{F}$		N.A.
	Portable plug connected luminaire with capacitor		N.A.
	Other plug connected luminaire with capacitor		N.A.
	Discharge device on or within capacitor		N.A.
	Discharge device mounted separately		N.A.

1.12 (12)	ENDURANCE TEST AND THERMAL TEST		
1.12 (12.3)	Endurance test:		
	- mounting position	(see Annex 2)	—
	- test temperature (°C)	35	—
	- total duration (h)	240	—
	- supply voltage: Un factor; calculated voltage (V)	253	—
	- lamp used	1x 3,5W LED G9	—

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Clause	Requirement – Test	Result - Remark	Verdict
1.12 (12.3.2)	After endurance test:		
	- no part unserviceable		Pass
	- luminaire not unsafe		Pass
	- no damage to track system		N.A.
	- marking legible		Pass
	- no cracks, deformation etc.		Pass
1.12 (12.4)	Thermal test (normal operation)	(see Annex 2)	Pass
1.12 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	N.A.
1.12 (12.6)	Thermal test (failed lamp control gear condition):		
1.12 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A)		N.A.
	- case of abnormal conditions		N.A.
	- electronic lamp control gear		N.A.
	- measured winding temperature (°C) at 1,1 Un		—
	- measured mounting surface temperature (°C) at 1,1 Un		N.A.
	- calculated mounting surface temperature (°C)		N.A.
	- track-mounted luminaires		N.A.
1.12 (12.6.2)	Temperature sensing control		
	- case of abnormal conditions		—
	- thermal link		N.A.
	- manual reset cut-out		N.A.
	- auto reset cut-out		N.A.
	- measured mounting surface temperature (°C)		N.A.
	- track-mounted luminaires		N.A.
1.12 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		
1.12 (12.7.1)	Luminaire without temperature sensing control		
1.12 (12.7.1.1)	Luminaire with fluorescent lamp ≤ 70W		
	Test method 12.7.1.1 or Annex V		—
	Test according to 12.7.1.1:		
	- case of abnormal conditions		—
	- ballast failure at supply voltage (V)		—
	- components retained in place after the test		N.A.
	- test with standard test finger after the test		N.A.
	Test according to Annex V:		
	- case of abnormal conditions		—

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Clause	Requirement – Test	Result - Remark	Verdict
	- measured winding temperature (°C): at 1,1 Un		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un		—
	- calculated temperature of fixing point/exposed part (°C)		—
	Ball-pressure test:		
	- part tested; temperature (°C)		N.A.
	- part tested; temperature (°C)		N.A.
1.12 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		
	- case of abnormal conditions		—
	- measured winding temperature (°C): at 1,1 Un ..		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un		—
	- calculated temperature of fixing point/exposed part (°C)		—
	Ball-pressure test:		
	- part tested; temperature (°C)		N.A.
	- part tested; temperature (°C)		N.A.
1.12 (12.7.1.3)	Luminaire with short circuit proof transformers ≤ 10 VA		
	- case of abnormal conditions		—
	- components retained in place after the test		N.A.
	- test with standard test finger after the test		N.A.
1.12 (12.7.2)	Luminaire with temperature sensing control		
	- thermal link		—
	- manual reset cut-out		—
	- auto reset cut-out		—
	- case of abnormal conditions		—
	- highest measured temperature of fixing point/exposed part (°C):		—
	Ball-pressure test:		
	- part tested; temperature (°C)		N.A.
	- part tested; temperature (°C)		N.A.
1.13 (9)	RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE		
1.13 (9.2)	Tests for ingress of dust, solid and moisture:		
	- classification according to IP	IP 20	—
	- mounting position during test		—
	- fixing screws tightened; torque (Nm)		—
	- tests according to clauses	9.2.0	—

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Clause	Requirement – Test	Result - Remark	Verdict
	- electric strength test afterwards	(see 10.2.2)	Pass
	a) no deposit in dust-proof luminaire		N.A.
	b) no talcum in dust tight luminaire		N.A.
	c) no trace of water on current-carrying parts or SELV parts or where it could become a hazard		N.A.
	1) for luminaires without drain holes – no water entry		N.A.
	2) for luminaires with drain holes – no hazardous water entry		N.A.
	d) no water in watertight luminaire		N.A.
	e) - no contact with live parts (IP 2X)		N.A.
	- no entry into enclosure (IP 3X and IP 4X		N.A.
	- no contact with live parts (IP3X and IP4X)		N.A.
	f) no trace of water on part of lamp requiring protection from splashing water		N.A.
	g) no damage of protective shield or glass envelope		N.A.
1.13 (9.3)	Humidity test 48 h	25°C; 93% R.H.	Pass

1.14 (10)	INSULATION RESISTANCE AND ELECTRIC STRENGTH		
1.14 (10.2.1)	Insulation resistance test:		
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø	Covered by metal foil	—
	Insulation resistance (MΩ):		—
	SELV:		
	- between current-carrying parts of different polarity		N.A.
	- between current-carrying parts and mounting surface		N.A.
	- between current-carrying parts and metal parts of the luminaire		N.A.
	Other than SELV:		
	- between live parts of different polarity	> 2 MΩ	Pass
	- between live parts and mounting surface ...:	> 4 MΩ	Pass
	- between live parts and metal parts	> 4 MΩ	Pass
	- between live parts of different polarity through action of a switch		N.A.
1.14 (10.2.2)	Electric strength test:		
	Dummy lamp		N.A.
	Luminaires with ignitors after 24 h test		N.A.
	Luminaires with manual ignitors		N.A.

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Clause	Requirement – Test	Result - Remark	Verdict
	Test voltage (V):		
	SELV:		
	- between current-carrying parts of different polarity		N.A.
	- between current-carrying parts and mounting surface		N.A.
	- between current-carrying parts and metal parts of the luminaire		N.A.
	Other than SELV:		
	- between live parts of different polarity	1460 V	Pass
	- between live parts and mounting surface ...:	3670 V	Pass
	- between live parts and metal parts	3670 V	Pass
	- between live parts of different polarity through action of a switch		N.A.
1.14 (10.3)	Touch current (mA)	< 0,1	Pass
1.15 (13)	RESISTANCE TO HEAT, FIRE AND TRACKING		
1.15 (13.2.1)	Ball-pressure test:		
	- part tested, temperature (°C)		N.A.
	- part tested, temperature (°C)		N.A.
1.15 (13.3.1)	Needle flame test (10 s)		
	- part tested		N.A.
	- part tested		N.A.
1.15 (13.3.2)	Glow wire test (650°C)		
	- part tested		N.A.
	- part tested		N.A.
1.15 (13.4.1)	Tracking test: part tested		N.A.

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Clause	Requirement – Test	Result - Remark	Verdict

	ANNEX 1: components		
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object/part No.	manufacture/ trademark	type/model	technical data	standard	mark(s) of conformity ¹⁾
Lampholder	KR	K540L	G9, 2A/250V, T250		6
Terminal block	ARDITI	art.145	4A,250V, 2x1,5mm ²		13
Flexible PVC cable ²⁾	ECW	--	H03VVH2-F 2 x 0,75 mm ²		1
Heat shrinkable tubing	Radpol	RC	-55°C ÷ +105°C		
Cord-grip	DW Bendler GmbH	261900			

¹⁾ an asterisk indicates a mark which assures the agreed level of surveillance

²⁾ cord was weared decorative braided sleeving

No.	mark of conformity	No.	mark of conformity	No.	mark of conformity	No.	mark of conformity
1	CE	2	VDE	3	SEV	4	ÖVE
5	DEMKO	6	SEMKO	7	NEMKO	8	FIMKO
9	BSI	10	UL	11	CSA	12	UTE
13	IMQ	14	B	15	CEBEC	16	KEMA

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Clause	Requirement – Test	Result - Remark	Verdict

	ANNEX 2: temperature measurements, thermal tests of Section 12		
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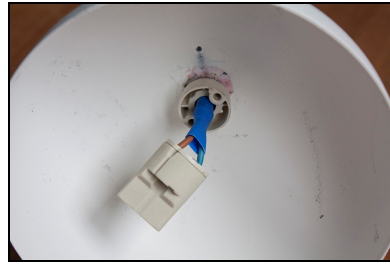
	Type reference	02501	—
	Lamp used	1x3,5W LED G9	—
	Lamp control gear used	—	—
	Mounting position of luminaire	Ceiling pendant	
	Supply wattage (W)	3,5 W	—
	Supply current (A)		—
	Calculated power factor		—
	Table: measured temperatures corrected for Ta = 25°C		
	- abnormal operating mode		—
	- test 1: rated voltage		—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage	243,8V	—
	- 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		—

temperature (°C) of part	clause 12.4 - normal				clause 12.5 - abnormal	
	test 1	test 2	test 3	limits	test 4	limit
Mounting surface (over the luminaire)		25		90		
Lampholder		116		250		
Insulation of the cord by the lampholder terminals		63		90		
Cord ancorage (cord grip) - insulation of the cord		34		75		
Wooden body of the luminaire		37		90		

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Clause	Requirement – Test	Result - Remark	Verdict
ANNEX 3: screw terminals (part of the luminaire)			
(14)	SCREW TERMINALS		
(14.2)	Type of terminal	art.145 ARDITI IMQ certified	—
	Rated current (A)	4A 250V~	—
(14.3.2.1)	One or more conductors		N.A.
(14.3.2.2)	Special preparation		N.A.
(14.3.2.3)	Terminal size		N.A.
	Cross-sectional area (mm ²)		N.A.
(14.3.3)	Conductor space (mm)		N.A.
(14.4)	Mechanical tests		N.A.
(14.4.1)	Minimum distance		N.A.
(14.4.2)	Cannot slip out		N.A.
(14.4.3)	Special preparation		N.A.
(14.4.4)	Nominal diameter of thread (metric ISO thread) :	M	N.A.
	External wiring		N.A.
	No soft metal		N.A.
(14.4.5)	Corrosion		N.A.
(14.4.6)	Nominal diameter of thread (mm)		N.A.
	Torque (Nm)		N.A.
(14.4.7)	Between metal surfaces		N.A.
	Lug terminal		N.A.
	Mantle terminal		N.A.
	Pull test; pull (N)		N.A.
(14.4.8)	Without undue damage		N.A.

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Clause	Requirement – Test	Result - Remark	Verdict
ANNEX 4: screwless terminals (part of the luminaire)			
(15)	SCREWLESS TERMINALS		
(15.2)	Type of terminal	Lampholder K540L SEMKO certified	—
	Rated current (A)	2A 250V	—
(15.3.1)	Material		N.A.
(15.3.2)	Clamping		N.A.
(15.3.3)	Stop		N.A.
(15.3.4)	Unprepared conductors		N.A.
(15.3.5)	Pressure on insulating material		N.A.
(15.3.6)	Clear connection method		N.A.
(15.3.7)	Clamping independently		N.A.
(15.3.8)	Fixed in position		N.A.
(15.3.10)	Conductor size		N.A.
	Type of conductor		N.A.
(15.5.1)	Terminals internal wiring		N.A.
(15.5.1.1)	Pull test spring-type terminals (4 N, 4 samples)		N.A.
(15.5.1.2)	Pull test pin or tab terminals (4 N, 4 samples)		N.A.
	Insertion force not exceeding 50 N		N.A.
(15.5.2)	Permanent connections: pull-Off test (20 N)		N.A.
(15.6)	Electrical tests		
	Voltage drop (mV) after 1 h (4samples)		N.A.
	Voltage drop of two inseparable joints		N.A.
	Numbers of cycles		—
	Voltage drop (mV) after 10 th alt. 25 th cycle (4 samples)		N.A.
	Voltage drop (mV) after 50 th alt. 100 th cycle (4 samples)		N.A.
	After ageing, voltage drop (mV) after 10 th alt. 25 th cycle (4 samples)		N.A.
	After ageing, voltage drop (mV) after 50 th alt. 100 th cycle (4 samples)		N.A.
(15.7)	Terminal external wiring		N.A.
	Terminal size and rating		N.A.

Remarks



Lampholder - connections



Luminaire 02501

BASIC TEST AND MEASURING EQUIPMENT LIST

Type	LABEL ref.
Thermal cabinet	0001
Draught-proof enclosure	0005
Humidity cabinet	0012
Megaohmmeter	1001
Multimeter	1003
Power meter	1004
Thermometer	1011
Test finger (IEC61032 figure 2)	2001
Test peg (IEC61032 figure 8)	2002
Spring hammer	2006
Needle flame test apparatus	2007
Ball pressure test apparatus	2003
High voltage tester	4001
Torque test apparatus	4005 i 4006