

Test Report

Photobiological Safety Assessment

R-2356-1 V1

CUSTOMER INFORMATION	
Customer	APPLETON GROUPE ATX E.I.N 35 rue André Durouchez, CS98017 F-80084 – AMIENS CEDEX 2
Order followed by	M. Bertrand CHATELAIN
Customer reference	Order P579670/15057 the 12/19/2018
PISEO LABORATORY INFORMATION	
Test Laboratory	PISEO SAS, Parc Lyon Sud, 4 Rue de l' Arsenal, F-69200 VENISSIEUX
Testing instruments	
Everfine OST-300 bench - Asset N°065 Yokogawa WT3000 power analyser - Asset N°120 AC Power Supply Chroma 6408 Asset N°010 Pt100, 1/10 DIN 4 wires SF50-10-4-PB-1-6-50 - Asset N°146 Relative humidity probe EE061-F61 - Asset N°136 National Instruments 9219 datalogger - Asset N°140	
Quote Reference / Service	D-2356 Photobiological Risk Assessment
Report version and date	V1 on the 01/15/2019
Date of tests	January, the 16 th , 2019
Applicable standards	- EN 62471 : December 2008 Photobiological safety of lamps and systems using lamps - IEC TR 62778 Edition 2 : July 2017 (Test done without COFRAC accreditation) Application of IEC 62471 for the assessment of blue light hazard to light sources and luminaires
Ambiant laboratory temperature	25.0°C +/- 1.0°C and relative humidity < 65.0 %
Stabilization time	Stabilized
PRODUCT INFORMATION	
Product	FELED 3.0
Manufacturer	APPLETON GROUPE ATX
Type	Luminaire
Identification / Serial number	FELED7CBUSAD
Light source technology	<input checked="" type="checkbox"/> LED <input type="checkbox"/> Fluo <input type="checkbox"/> Halogène <input type="checkbox"/> Autres: <input style="width: 100px; height: 15px;" type="text"/>
Light source designation	Led
Power supply	230.0 VAC 50.0 Hz
Ballast / Driver	Integrated
Date and sampling method	Supplied by customer
Piseo sample ID	E-2356-1
REMARKS	
<ul style="list-style-type: none"> - Traceability and standard(s) photometrical and colorimetical calibration certificates references can be transmitted on request - Current report is based on tests performed on one specimen, or sample. It does not prejudice conformity of whole manufactured products. It is not permitted de transfer results on other systems or configurations. - Reproduction in any form, in whole or in part, without the express written consent of PISEO is strictly prohibited - Temperature and relative humidity records during measurement and stabilization phases are available on request - Measurements with “#” sign are not under COFRAC accreditation - The data preceded by « # » are not given by the customer, but noted by PISEO - The measurement does not take the uncertainties of equipment. They are available on request 	

PICTURE(S) OF THE DUT



RISK GROUP CLASSIFICATION

Risk Group 0 (No Risk)

MEASUREMENT CONDITIONS

Ageing	N/A (LED)
GLS / non GLS consideration	<input checked="" type="checkbox"/> GLS*** (200 mm - IEC 60598-1) <input type="checkbox"/> GLS*** (500 lx) <input type="checkbox"/> GLS*** <input type="checkbox"/> Non-GLS (200 mm distance) <input type="checkbox"/> Non-GLS
System electrical power consumption	73.5 W
Power factor	# 0.973
Measurement distance	200 mm

***GLS : General Lighting Service (according to standard definition)

THRESHOLD DISTANCE D_{Thr} if RG2 regarding IEC TR 62778 : Juillet 2014	
Calculated threshold illuminance limit	
E_{Thr}	NA
Measured maximum intensity value - Goniophotometer	
I_{Max}	NA
Calculated limit distance	
D_{Thr}	NA

Calculated distance D_{Thr} is the distance (in meters) at which the threshold illuminance E_{Thr} occurs.

For white LEDs, in case of RG2 risk group, modules and luminaires security standards demand mandatory marking. To have more information about marking, please respectively refer to EN 60598 and EN 62031 standard serie.

LED lamps with > RG1 photobiological group risk can't be commercialized in EUROPE.

- **Covered range :**

By extension, report measurements allow to extend maximum **Risk Group 0 (No Risk)** to the following references:

FELED 3.0 Ordering Grid

Series	LED Position	Lumen Output (4)	Color Temperature	Voltage
FELED - Zone 1, 2, 21, 22 ATEX/IECEX Certified	Blank - Direct (with diffuser) I - Indirect (without diffuser)	3 - 3K 4 - 4K 5 - 5K 7 - 7K	C - 5000K (Cool) N - 4000K (Neutral)	BU - 120-277Vac, 125-300Vdc, 50/60 Hz BD - 100 to 240 Vac, 50/60 Hz (5)

Mounting Version	Cable Entry	Options
S - Surface/Suspension Mount Standard Wiring (single phase) L - Surface/Suspension Mount Dual Loop In/Out Through Wiring (single phase)	A - Armored M20 (2) N - Unarmored M25 (3)	D - Diffused (6) E - 3H Emergency (combined) (1) V - 0-10V Dimming


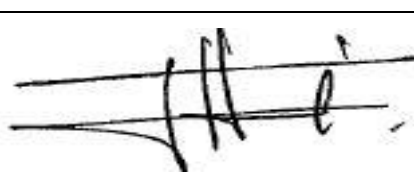
Model Details:

Fixture Configuration	LED Array	Quantity of LED Array	Driver	Quantity of Driver	Driver Output Current
2ft, 3000 lumen	17 LED Encapsulated Array	2	Moons 50W	1	550
2ft, 4000 lumen	17 LED Encapsulated Array	2	Moons 50W	1	800
4ft, 5000 lumen	17 LED Encapsulated Array	4	Moons 50W	1	950
4ft, 7000 lumen	17 LED Encapsulated Qinsun array	4	Moons 50W	2	675

# RISK GROUP LIMIT VALUES TABLE FOR LUMINAIRES IN STEADY CYCLE									
Hazard	Spectrum	Symbol	Group risk limit values						Units
			GR0		GR1		GR2		
			No Risk	Result	Low Risk	Result	Moderate Risk	Result	
UV actinic UV	$S_{UV}(\lambda)$	E_S	0.001	7.3^{e-5}	0.003	-	0.03	-	$W.m^{-2}$
Near UVA		E_{UVA}	10	3.1^{e-3}	33	-	100	-	$W.m^{-2}$
Blue Light	$B(\lambda)$	L_B	100	86	10000	-	4000000	-	$W.m^{-2}.sr^{-1}$
Blue Light for small source	$B(\lambda)$	E_B	0.01*	-	1.0	-	400	-	$W.m^{-2}$
Thermal Retinal	$R(\lambda)$	L_R	28000/ α	2.3^{e3}	28000/ α	-	71000/ α	-	$W.m^{-2}.sr^{-1}$
Thermal Retinal, weak visual stimulus **	$R(\lambda)$	L_{IR}	6000/ α	1.4	6000/ α	-	6000/ α	-	$W.m^{-2}.sr^{-1}$
Infrared for eye		E_{IR}	100	1.1^{e-01}	570	-	3200	-	$W.m^{-2}$

* Small source defined by $\alpha < 0.011$ radian. The averaged FOV (Field Of View) at 10000s is 0.1 radian

** Implies non-GLS source assesment

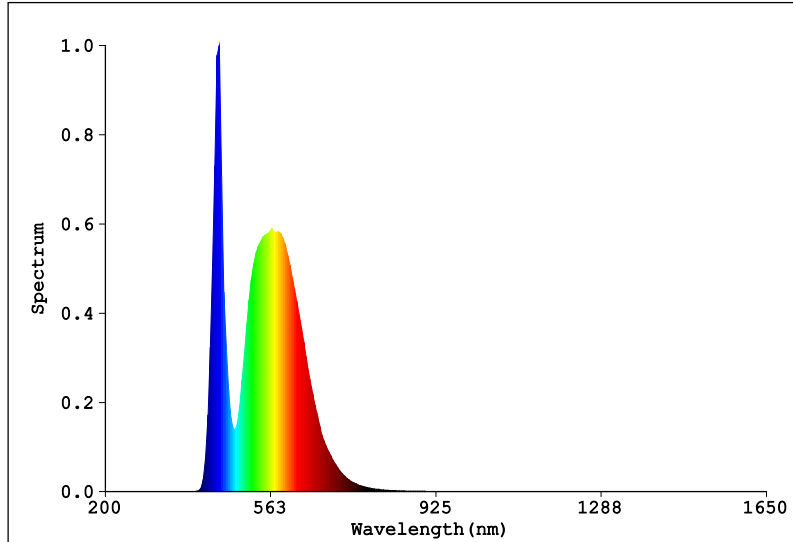
Report page number	4 report pages and 1 annex page
Test and Measurement Technician	M. VERHÉE Cédric
Signature	
Director	M. Joël THOME
Signature	
Vénissieux, January 18, 2019	

* End of the accredited COFRAC report *

Radiation Photobiological Safety Report

Model : FELED7CBUSAD
Number : E-2356-1
Manufacturer:
Tester : CVE
Date : 2019-01-16

Instrument : OST-300(EVERFINE)
Temperature : 25.4deg
RH : 24.2%
Remarks : IEC TR 62778:2014 NF EN 62471:2008
 B(L) & R(L)



LB RFOV (mrad)	Measured (W/m2/sr)	Limit (W/m2/sr)
100(Exempt Risk Group)	8.6e+01	1.0e+02
11(Risk Group 1)	1.8e+02	1.0e+04
1.7(Risk Group 2)	2.0e+02	4.0e+06
LR RFOV (mrad)	Measured (W/m2/sr)	Limit (W/m2/sr)
11(Exempt Risk Group)	2.3e+03	3.1e+05
11(Risk Group 1)	2.3e+03	3.1e+05
1.7(Risk Group 2)	2.5e+03	7.8e+05

Color Parameters:

Chromaticity Coordinate: $x=0.3363$ $y=0.3430$ $u'=0.2088$ $v'=0.4791$ $Tc=5332K$

Dominant WL: $L_d=565.5nm$ Peak WL: $L_p=450.0nm$ Purity=3.8% Red Ratio: $R=15.8%$

Render Index: $Ra=76.3$ FWHM=26.3nm

$R1=76$ $R2=80$ $R3=81$ $R4=78$ $R5=77$ $R6=72$ $R7=82$
 $R8=65$ $R9=-6$ $R10=50$ $R11=77$ $R12=51$ $R13=76$ $R14=89$ $R15=72$

Photo Parameters:

Distance = 200.0mm

Alpha = 0.0910rad

E = 11947.3lx

$E_s = 7.3e-05 W/m^2$ $T_{max_Es} > 8h$

$E_b = 8.9e+00 W/m^2$ $T_{max_Eb} = 11s$

$E_{uva} = 3.1e-03 W/m^2$ $T_{max_E_{uva}} > 1000s$

$E_{ir} = 1.1e-01 W/m^2$ $T_{max_E_{ir}} > 1000s$

$E_h = 3.7e+01 W/m^2$ $T_{max_E_h} < 4479s$

$L_B = 8.6e+01 W/m^2/Sr$ $T_{max_LB} < ---$

$L_R = 2.3e+03 W/m^2/Sr$ $T_{max_LR} < 10s$

$L_{ir} = 1.4e+00 W/m^2/Sr$ ($t > 10s$)

Result:

Lamp Type: Exempt Group