



# TEST REPORT No. 1/07.06.22./TM-11

# SIA Baltic Research Center test report for projecting long term lumen maintenance of LED light sources

Report reference No.	1/07.06.22./TM-11
Date of Issue	08.06.2022.
Project Handler	Ingmārs Felcis
Testing Laboratory	SIA Baltic Research Center
Address	Gaujas iela 11, Rīga, LV-1026, Latvia
Client	SIA VIZULO
Client number	1
Address	Bukultu iela 11, Riga, LV-1005, Latvia
Test specification	SIA Baltic Research Center test and calculation method is based on the requirements in the following standards: IES TM-21-11; ENERGY STAR® TM-21 Calculator, rev. 06.18.18
TRF originated by	SIA Baltic Research Center, Ingmārs Felcis
Copyright blank test report	This report based on the content of the standard (see above). The test report considered selected clauses of the a.m. standard(s) and experience gained with product testing. It was prepared by SIA Baltic Research Center, takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.
Number of pages (Report)	6

Compiled and approved by: Head of Laboratory, Ingmārs Felcis (+signature)



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Test object ID	10106202208		
Type of test object	LED street and territory luminaire		
Trade mark	VIZULO MICRO MARTIN		
Model and/or type reference	MRUE 075 730 L05 AA016 CSN NG1		
Rating(s)	AC: 230-240 V~, 50-60 Hz		
Manufacturer	Same as above		
Address	Same as above		
Order Description	Test according to the test specification and for the following items:		
	In-situ temperature measurements test (ISTMT);		
	2) Temperature test of Tc point on the LED driver;		
	3) Lumen maintenance projection according to TM-21		
Date of order	27.05.2022.		
Date of receipt of test item	31.05.2022.		
Date(s) of performance of test	07.06.2022.		
Equipment used	AC power source T023; Digital power measuring device T024; Thermal		
	chamber T022; Thermocouple Datalogger B010;		
Lamp type	☐ Bare lamp		
	⊠ Cover lamp, no reflector		
	☐ Lamp with reflector		
	☐ Other:		
Rated Voltage	230-240 V~, 50-60 Hz		
Rated Power	75 W		

#### General remarks:

Throughout this report, a point is used as the decimal separator.

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

This report shall not be reproduced except on full without the written approval of the testing laboratory.

SIA Baltic Research Center is an accredited photometric, colorimetric and photobiological safety testing laboratory by LATAK (Latvian National Accreditation Bureau) acc. to EN 17025 using testing methods based on IESNA TM-21-11 standard.

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### Photo of the sample:



Model No.: MRUE 075 730 L05 AA016 CSN NG1





#### **Test results**

#### In-situ temperature measurements test (ISTMT)

#### **Electrical Input Results**

Input voltage:	23	30V~, 50 Hz	'~, 50 Hz Input current on LED:			716 mA	Input power:		75 W
Test time:		420 minutes Tempe time:		erature stabilization 120 minu		120 minute	s		
Temperature Re	sult	s							
Maximum temperature reached T <sub>1</sub> °C, LED			64.1						
Maximum ambient temperature reached T <sub>4</sub> °C			25.1						
Test results									
Reported lumen maintenance life			L9	90 > 60 000 hours					
The time in hours when L <sub>90</sub> B <sub>50</sub> is attained			103 100 hours						
The time in hours when L <sub>90</sub> B <sub>10</sub> is attained			10	03 100 hours					
Estimate lumen maintenance at 60 000 h			L9	93 (93.69%)					
Estimate lumen maintenance at 100 000 h			L9	90 (90.26%)					

Comments:

LED used in the luminaire - LUXEON 5050

Results refer to the same luminaire family with the same power or lower configuration.

The luminaire was tested as intended for use – luminous area facing downwards with a glass diffusor over the LED and driver area.

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## **Lumen maintenance projection according to TM-21-11**

		LM-8	0 Test Inputs				
Description of LED Light Source Tested		Test [	Data for 55⁰C Case	Test D	oata for 85ºC Case	Test D	ata for 105ºC Case
(manufacturer, model, catalog number)		Temperature			Temperature		Temperature
VIZULO SIA, MRUE 075 730 L05 AA016 CSN NG1		Time	Lumen Maintenance	Time	Lumen Maintenance	Time	Lumen Maintenance
		(hours)	(%)	(hours)	(%)	(hours)	(%)
		0	100.00%	0	100.00%	0	100.00%
		1000	99.90%	1000	99.10%	1000	98.00%
		2000	99.70%	2000	98.70%	2000	97.30%
		3000	99.60%	3000	98.40%	3000	96.90%
		4000	99.60%	4000	98.10%	4000	96.50%
LM-80 Testing Details		5000	99.40%	5000	97.90%	5000	96.20%
Total number of units tested per case temperature	24	6000	99.30%	6000	97.70%	6000	95.90%
Number of failures:	0	7000	99.20%	7000	97.60%	7000	95.60%
Number of units measured:	24	8000	99.20%	8000	97.50%	8000	95.30%
Test duration (hours):	10000	9000	99.10%	9000	97.40%	9000	94.80%
Tested drive current (mA):	750	10000	98.90%	10000	97.40%	10000	94.10%
Tested case temperature 1 (T <sub>c</sub> , <sup>o</sup> C):	55						
Tested case temperature 2 (T <sub>c</sub> , °C):	85						
Tested case temperature 3 (T <sub>c</sub> , °C):	105						
In-Situ Inputs  Drive current for each LED package/array/module (mA):	716						
In-situ case temperature (T <sub>c</sub> , °C): Percentage of initial lumens to project to (e.g. for	90						
L <sub>70</sub> , enter 70):	90						
Results							
Time (t) at which to estimate lumen maintenance (hours):	100 000						
	00.000/						
Lumen maintenance at time (t) (%):	90.26%						

**BALTIC RESEARCH CENTER SIA** 

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# **TM-21 Report**

Description of LED Light Source
Tested (manufacturer, model,
catalog number)

Table 1: Report at each LM-80 Test Condition
VIZULO SIA, MRUE 075 730 L05 AA016 CSN NG1

Test Condition 1 - 55°C Case Temp			
Sample size	24		
Number of failures	0		
DUT drive current used in the test (mA)	750		
Test duration (hours)	10 000		
Test duration used for projection (hour to hour)	5,000 - 10,000		
Tested case temperature (°C)	55		
α	8.932E-07		
В	0.998		
Reported L90(10k) (hours)	>60000		

Test Condition 2 - 85°0	C Case Temp
Sample size	24
Number of failures	0
DUT drive current used in the test (mA)	750
Test duration (hours)	10 000
Test duration used for projection (hour to hour)	5,000 - 10,000
Tested case temperature (°C)	85
α	1.024E-06
В	0.983
Reported L90(10k) (hours)	>60000

Test Condition 3 - 105°C Case			
Sample size	24		
Number of failures	0		
DUT drive current used in the test (mA)	750		
Test duration (hours)	10 000		
Test duration used for projection (hour to hour)	5,000 - 10,000		
Tested case temperature (°C)	105		
α	4.232E-06		
В	0.984		
Reported L90(10k) (hours)	21 000		

Table 2: Interpolation Report (projection based on <i>in-situ</i> temperature entered)			
T <sub>s,1</sub> (°C)	55.00		
T <sub>s,1</sub> (K)	328.15		
$\alpha_1$	8.932E-07		
B <sub>1</sub>	0.998		
T <sub>s,2</sub> (°C)	85.00		
T <sub>s,2</sub> (K)	358.15		
α <sub>2</sub>	1.024E-06		
$B_2$	0.983		
E <sub>a</sub> /k <sub>b</sub>	5.37E+02		
A	4.584E-06		
B <sub>0</sub>	0.991		
T <sub>s,i</sub> (°C)	64.10		
T <sub>s,i</sub> (K)	337.25		
$\alpha_{i}$	9.335E-07		
Reported L90(10k) at	>60000		

Report Generated By: Head of laboratory Mr. Ingmars Felcis	Notes: TM-21-11 report based on 20211209_LUXEON 5050 Series incl Horticulture - 10000hrs 50-100-150-200mA 55-85-105C LM-80 Report for
Company: SIA Baltic Research Center	Vizulo
Date: 07.06.2022.	1