

PRIMUS LIGHTING INC

TEST REPORT

SCOPE OF WORK

Performance testing of string lighting

REPORT NUMBER

105470679DAL-001

ISSUE DATE

31-Jul-2023

PAGES

8

DOCUMENT CONTROL NUMBER

GFT-OP-10a (6-March-2017)

© 2017 INTERTEK



TEST REPORT

31-Jul-2023

Intertek Report No. 105470679DAL-001
Intertek Project No. G105470679

[REDACTED]
Primus lighting Inc
[REDACTED]

Subject: Performance testing of string lighting

[REDACTED],

Intertek wishes to inform you that, the testing in accordance with the test method provided/approved by Primus lighting Inc has been completed on the samples provided to Intertek. The samples received by Intertek were set up and tested in accordance with the appropriate test requirements. The samples tested were as follows:

SAMPLE LIST

Sample ID	Sample description	Sample quantity provided
DAL 12696, DAL 12695, DAL 12694, DAL 12693, DAL 12692, DAL 12691, DAL 12690, DAL 12689	String lighting (bulbs with covers)	8

This report serves to provide details on the testing performed on the samples such as the test method, test equipment, test conditions etc. Each sample tested was given either a pass or fail rating after comparing the sample condition to the test criteria present in the appropriate standard/method. If the test is to only record data with no pass/fail criteria then only data is provided as part of this report. In case of any observed failures of the samples, details are provided below in this test report as to the location and type of failure. If further details are needed or if something is not clear regarding the analysis in the report then please feel free to reach out to your dedicated project engineer.

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

TEST REPORT

Scope of Test/Test method:

The intent of the test is to determine the durability and resilience of the string lights to survive cold weather conditions along with mechanical stresses like pulling force and impact. Follow the following steps in order to conduct the testing:

1. Place the string lights with bulb covers in the chamber in such a manner that they are suspended in the air and not touching each other. Spacing between the light bulbs on the wire is not to exceed 12 inches. A minimum of 4 lights with covers need to be tested.
2. Turn on the chamber and condition the lights in accordance with IEC 60068-2-1 conditioning at minus 40 deg C for 100 hours. Lights need to be operational throughout testing.
3. Before, during and after the testing, impact testing and pull testing will be carried out. These will be conducted at 0, 50 and 100 hours of conditioning.
4. For impact testing, a 0.5J impact will be applied once in the middle of each bulb cover
5. For pull testing, 10 pulls of 100N will be applied on the wiring with each pull lasting 1 second each. Pull testing will be conducted on each bulb at the location where the wiring enters the bulb socket holder.
6. Impact testing followed by pull testing will be conducted in succession. Both tests shall be conducted within 10 mins after cold conditioning
7. Impact testing and pull testing will be carried out at 0, 50 and 100 hours of conditioning. For 0 hours, conduct the mechanical testing before starting cold conditioning. At 50 hours, the chamber can be turned off before performing the mechanical tests however the tests should be done within 10 mins
8. Record the following items during testing:
 - Operation and function of the lights at 0, 50 and 100 hours
 - Strength and integrity of the bulbs after performing mechanical tests at 0, 50 and 100 hours

TEST REPORT

Test results:

Sample no.	Functionality check	Mechanical testing
1 (DAL12693)	Bulb was functional at 0, 50 and 100 hours of testing	Wiring integrity remained intact during and after testing. Impact testing caused cracks on the bulb cover surface but did not shatter. Cracks shown in photo section below
2 (DAL12694)	Bulb was functional at 0, 50 and 100 hours of testing	Wiring integrity remained intact during and after testing. Impact testing caused cracks on the bulb cover surface but did not shatter. Cracks shown in photo section below
3 (DAL12695)	Bulb was functional at 0, 50 and 100 hours of testing	Wiring integrity remained intact during and after testing. Impact testing caused cracks on the bulb cover surface but did not shatter. Cracks shown in photo section below
4 (DAL12696)	Bulb was functional at 0, 50 and 100 hours of testing	Wiring integrity remained intact during and after testing. Impact testing caused cracks on the bulb cover surface but did not shatter. Cracks shown in photo section below

TEST REPORT

Photos:

Sample as received with packaging



Sample photo



TEST REPORT

Samples inside chamber during testing



TEST REPORT

Photos showing cracks on the bulbs from impact



TEST REPORT

The following list shows the equipment which was used for successfully carrying out the tests covered by this report:

Test equipment list			
No.	Equipment name	Equipment ID	Cal due*
1	Ambient Logger	ID-5088-P	11/11/2023
2	Tap Measure	ID-4885	ICO
3	0.5 kg steel ball	ID-459	VBU
4	Environmental Chamber	ID-2954	5/19/2024
5	Stop Watch	ID-5413	ICO
6	Scale	ID-4448	3/28/2024
7	Weights	N/A	VBU

*Calibration interval for each equipment is 12 months

Unless otherwise noted in the test plan, the ambient test conditions were as follows:

Temperature [°C]	Humidity [%RH]	Pressure [hPa]
23.3	50.0	989

Completed by:	Cody Gore	Reviewed by:	Faez Hasan
Title:	Engineer	Title:	Reviewer
Signature:		Signature:	