DLG Test Report 7433

Zumtobel Lighting GmbH

Moisture-proof diffuser luminaire AMPHIBIA PM

Resistance to ammonia

www.DLG-Test.de

Overview

A test mark „DLG-APPROVED for individual criteria“ is awarded for agricultural products which have successfully fulfilled a scope-reduced usability testing conducted by DLG according to independent and recognized evaluation criteria. The test is intended to highlight particular innovations and key criteria of the test object. The test may contain criteria from the DLG test scope for overall tests, or focus on other value-determining characteristics and properties of the test subject. The minimum requirements, test conditions and procedures as well as the evaluation bases of the test results will be specified in consultation with an expert group of DLG. They correspond to the recognized rules of technology, as well as scientific and agricultural knowledge and requirements. The successful testing is concluded with the publication of a test report, as well as the awarding of the test mark which is valid for five years from the date of awarding.

The ammonia resistance test was performed as a laboratory test according to the patented DLG test standard. This test is intended to determine the suitability of equipment for animal living areas to withstand the impacts of animal environments.

Other criteria were not tested.

Assessment in brief

The moisture-proof diffuser luminaire AMPHIBIA PM has successfully completed the DLG test for ammonia resistance.

According to this result, it can be assumed that these luminaires are resistant to the typical environmental conditions of animal living areas and that no accelerated reduction of the product lifetime will occur.

In addition, the moisture-proof diffuser luminaire AMPHIBIA PM was operated actively in the chamber for the entirety of the test. No product damage was observed here.

Table 1:
Assessment in brief

DLG QUALITY PROFILE	Evaluation*
Ammonia resistance	■ ■ ■ ■ □
Preservation of the luminous flux	■ ■ ■ ■ ■

* DLG Evaluation range:
■ ■ ■ or better = meets, exceeds or significantly exceeds the established DLG standards
■ ■ = meets the legal requirements for marketability, ■ = failed

The Product

Manufacturer and applicant

Zumtobel Lighting GmbH
Schweizer Strasse 30
6851 Dornbirn
Austria

Product:
Moisture-proof diffuser luminaire AMPHIBIA AMP S 4600-840 PM WB/AB/NB/MB, 1.1 m long

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Description and technical data

The moisture-proof diffuser luminaire AMPHIBIA PM tested here is suitable for use in animal living areas.

The material of the housing consists of PMMA.

Table 2:
Technical data (according to manufacturer)

	AMPHIBIA PM
Electrical connection	
Voltage	220-240 V
Frequency	0/50/60 Hz
Rated input power	31 W
Dimension and weight	
Width/length	92 mm/1,110 mm
Height	90 mm
Weight	2.31 kg
Additional technical data	
Number of LED modules	2
Housing material	PMMA
Colour temperature (CCT)	4000 K
Dimmable	yes
Light angle	Wide Beam
Luminous efficacy	149 lm/W

The Method

Resistance to ammonia

The ammonia resistance of the moisture-proof diffuser luminaire AMPHIBIA PM was determined by a laboratory test with one luminaire according to the patented DLG test standard for agricultural use. The laboratory test is designed to replicate the conditions of a usage period of about 10 years exposure to animal living areas.

The test was carried out in a climate chamber under the following climate conditions:

Test duration	1500 h
Air temperature	70 °C
Relative humidity	70 %
Ammonia concentration	750 ppm

For assessing the ammonia resistance, each luminaire was examined visually, gravimetrically and the plastic parts additionally through measurement of the hardness (Shore D) before and after the climate testing. The luminaires have additionally been following a cycle of operation predefined by DLG (3 hours on, 1 hour off) in order to evaluate any thermal impacts caused by switch-on and -off procedures during ammonia fumigation. Furthermore the luminous flux was measured according to DIN EN 13032 before and after the fumigation to get any additional information regarding the aging process.

In order to avoid overheating (> 70 °C), the luminaires could be operated at a reduced power level during the testing period.

For the approval of all luminaires in table 2, the moisture-proof diffuser luminaire “AMPHIBIA AMP S 4600-840 PM WB EVG, 1.1 m long” has been used. After the tests, the luminaires underwent visual examination to a reference sample that was identical in construction.

The Test Results in Detail

Resistance to ammonia

Visual test

The comparative visual examination after the ammonia exposure has shown minor discolorations at the inside of the luminaire housing. There were few discolorations on the outside of the housing. The deformation at the housing kept within limits.

It cannot be ruled out that a limited ammount of ammonium compounds might enter the luminaire housing. Also in this case, no negative impact on the luminaire performance needs to be expected.

The defects are rated as insignificant.

Gravimetric test

Weight comparisions before and after the ammonia fumigation have not shown any measurable increases or decreases in weight.

Hardness test

During the hardness test (Shore D) no measurable changes were observed. All determined changes were within the measurement incertainty.

Functional test

No defects were observed. All luminaires worked well after the conducted tests.

Preservation of the luminous flux

After completion of the test the luminaire still had a luminous flux of 95.5 %.

Based on the results of these tested parameters, the luminaire is evaluated as resistant to ammonia.

Summary

The results show that the moisture-proof diffuser luminaire AMPHIBIA PM fulfills the testing requirements for ammonia resistance and thus receives the test mark DLG-APPROVED. It can be expected that the luminaire is resistant to ammonical air in animal living areas and that no accelerated reduction of the product lifetime occurs.

The moisture-proof diffuser luminaire AMPHIBIA PM was operated both passively and actively during the ammonia fumigation in the test chamber and passed both tests successfully.

Other critera have not been assessed.

Further information

Testing agency

DLG TestService GmbH,
Gross-Umstadt location, Germany

The tests are conducted on behalf of DLG e.V.

DLG test framework

DLG-Approved Test “Leuchtsysteme in Ställen”
(current as of 03/2021)

Department

Agriculture

Division head

Dr. Ulrich Rubenschuh

Test engineer(s)

Dipl-Ing (FH) Tommy Pfeifer*

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DLG – the open network and professional voice

Founded in 1885 by the German engineer Max Eyth, DLG (Deutsche Landwirtschafts-Gesellschaft – German Agricultural Society) is an expert organisation in the fields of agriculture, agribusiness and the food sector. Its mission is to promote progress through the transfer of knowledge, quality standards and technology. As such, DLG is an open network and acts as the professional voice of the agricultural, agribusiness and food sectors.

As one of the leading organisations in the agricultural and food market, DLG organises international trade fairs and events in the specialist areas of crop production, animal husbandry, machinery and equipment for farming and forestry work as well as energy supply and food technology. DLG’s quality tests for food, agricultural equipment and farm inputs are highly acclaimed around the world.

For more than 130 years, our mission has also been to promote dialogue between academia, farmers and the general public across disciplines and national borders. As an open and independent organisation, our network of experts collaborate with farmers, academics, consultants, policymakers and specialists in administration in the development of future-proof solutions for the challenges facing the agriculture and the food industry.

Leaders in the testing of agricultural equipment and input products

The DLG Test Center Technology and Farm Inputs and its test methods, test profiles and quality seals hold a leading position in testing and certifying equipment and inputs for the agricultural industry. Our test methods and test profiles are developed by an independent and impartial commission to simulate in-field applications of the products. All tests are carried out using state-of-the-art measuring and test methods applying also international standards.

The AMPHIBIA PM was tested for the first time in 2017 and in 2018 the results were published in the DLG test report 6862. Re-certification was applied for in 2023. Due to a change in the DLG test framework, the luminaires were subjected to a re-measurement and passed again. According to the manufacturer, the AMPHIBIA PM will be sold unchanged in the originally tested version.

Internal test code DLG: 17-868; recertified and remeasured: 2305-0033

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