

DLG Test Report 7171

Siteco GmbH

Monsun 12

Resistance to ammonia,
cleaning distance, flicker free



SITECO MONSUN 12
✓ Resistance to ammonia
✓ Cleaning distance
✓ flicker free
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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.



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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. The cleaning distance test assesses the suitability for cleaning animal living areas. In the “Flicker-free” test – if necessary also with different dimming levels – frequencies and the modulation depth of a luminaire’s flicker is measured. Since the corresponding stressor does not apply, flicker-free light has a positive effect on animal health.

Other criteria were not tested.

Assessment – Brief Summary

The Damp-proof luminaire “Monsun 12” from Siteco GmbH has successfully completed the DLG test for ammonia resistance, cleaning distance and flicker free.

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, Damp-proof luminaire “Monsun 12” was operated actively in the chamber for the entirety of the test. No product damage was observed here.

Furthermore, a minimal cleaning distance of 10 cm was measured.

In undimmed state, the LED Damp-proof luminaire meets the high DLG standards.

Table 1:
 Assessment in brief

DLG QUALITY PROFILE	Evaluation*
Ammonia resistance	■ ■ ■ ■ □
Preservation of the luminous flux	■ ■ ■ ■ ■
Flicker free “Monsun 12”, not dimmed	■ ■ ■ □ □
Cleaning distance	■ ■ ■ ■ □

* 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

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Product:
LED Damp-proof luminaire „Monsun 12“

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Description and Technical Data

The LED Damp-proof luminaire “Monsun 12” tested is suitable for use in animal housings, in agricultural farm buildings and in covered outdoor areas.

Table 2:
Technical data (according to manufacturer)

Technical data	Monsun 12*		
	51FP107P430H	51FP107P460H	51FP10MP480H
Electrical connection			
Voltage		220...240V	
Frequency		50/60 Hz AC	
Rated input power	22 W	33 W	23... 45 W
Dimension and weight			
Length x width x height	1,590 mm x 90 mm x 88 mm		
Weight	2.5 kg		
Additional technical data			
Number of LED modules	2		
Housing material	glass-fibre reinforced polyester		
Cover	PMMA with stainless steel clips		
Protection rating	IP 66		
Colour temperature (CCT)	4,000 K		
Control gear	ECG, on-off	ECG, on-off Multilumen	
Beam angle	140°		
Rated luminous flux	3,970 lm	5,800 lm	4,120... 8,070 lm
Luminous efficacy	179 lm/W	178 lm/W	178 lm/W
Color rendering index (CRI)	> 80		
Ambient temperature	-35 °C ... +40 °C		
Impact resistance	IK 04		
Rated service life	70,000h L80B50 @ 35 °C		
dimnable	no		

* There are different variants of the „Monsun 12“ which are not shown because for lack of space

The Method

Resistance to ammonia

The ammonia resistance of the LED Damp-proof luminaire “Monsun 12” 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 in order to get 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.

Cleaning distance

During test bench examinations of the mechanical resistance to high-pressure cleaners, the minimum cleaning distance was determined.

The minimum cleaning distance is defined as the distance between nozzle and surface when no damages can be observed at the housing surface.

The test was conducted under the conditions presented in table 3.

Table 3:

Test conditions cleaning distance

Line pressure	~150 bar
Water	cold, approx. 1,000 l/h, no detergents
Nozzle type	Flat spray nozzle, 25°
Exposition time	1 minute
Distance	200 mm, 150 mm, 100 mm, 50 mm
Ambient temperature	10-20 °C

Flicker free

The frequency and modulation depth of the flicker of two test samples for each type of luminaire were measured and assessed at full power. If the luminaire provided is dimmable and dimming is also recommended for practical use, the above tests were also carried out at 50 % and 10 % of the nominal power.

For all test procedures, the LED Damp-proof luminaire “Monsun 12” in the length of 1,590mm 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 inside and outside the luminaire housing, but no negative impact on the luminaire performance needs to be expected. During the test, the luminaire appeared to be sufficiently gas-tight. Nevertheless it cannot be ruled out, that a limited amount of ammonia respectively ammonium compounds could enter the luminaire housing. Again, no negative impact on the luminaire performance needs to be expected. The defects are rated as insignificant. The examination of the manufacturer's mounting parts didn't also show any defects.

Gravimetric test: Weight comparisons 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 uncertainty.

Functional test: No defects were observed. All luminaires worked after the conducted tests.

Preservation of the luminous flux: After completion of the test the luminaire still had a luminous flux of 92.0%.

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

Cleaning distance

Even at a cleaning distance of only 10 cm, no damages to the luminaire could be observed. At no time a water ingress into the luminaires was noticed. In order to avoid damage to the luminaires during cleaning a minimum cleaning distance of 10 cm should always be ensured.

Flicker free

The frequency of the undimmed luminaire was 100 Hz (modulation depth 2.5%).

Summary

The results show that the LED Damp-proof luminaire "Monsun 12" fulfills the testing requirements for ammonia resistance, cleaning distance and flicker free and thus receives the test mark DLG-Approved. It can be expected that the luminaire is resistant to ammoniacal air in animal living areas and that no accelerated reduction of the product lifetime occurs.

The LED Damp-proof luminaire was operated both passively and actively during the ammonia fumigation in the test chamber and passed both tests successfully.

It is also recommended in any case to keep a minimum distance of 10 cm during cleaning.

In undimmed state, the LED Damp-proof luminaire meets the DLG requirements for flicker-free operation.

More 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 "Ammonia resistance"
(current as of 03/2021)

Department

Agriculture

Division head

Dr. Ulrich Rubenschuh

Test engineer(s)

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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.

Internal test code DLG: 2103-0001

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