DLG Test Report 7199

Trevos, a.s.

NANOTTICA ABS

Resistance to ammonia,
cleaning distance

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. The cleaning distance test assesses the suitability for cleaning animal living areas.

Other critera were not tested.

Assessment – Brief Summary

The LED light “NANOTTICA ABS” from Trevos, a.s. has successfully completed the DLG test for ammonia resistance and cleaning distance.

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 LED light “NANOTTICA ABS” was operated actively in the chamber for the entirety of the test. No product damage was observed here.

Furthermore, a minimal cleaning distance of 15 cm was measured.

Table 1:
Assessment in brief

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

Trevos, a.s., Nová Ves 34, 51101 Turnov, Czech Republic

Product:
LED light “NANOTTICA ABS” 1.2ft...1.4ft...1.5ft

Contact:
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Description and Technical Data

The LED light “NANOTTICA ABS” tested here is suitable for the use in animal housings and agricultural buildings.

Table 2:
Technical data (according to manufacturer)

	NANOTTICA ES ABS/NANOTTICA ABS		
	1.2ft	**1.4ft**	**1.5ft**
Electrical connection			
Voltage		220-240 V	
Frequency		50-60 Hz AC/DC	
Performance	8-15 W	16-43 W	20-54 W
Dimension and weight			
Length	615 mm	1175 mm	1455 mm
Width		95 mm	
Height		85 mm	
Weight	0.9 kg	1.7 kg	2.0 kg
Additional technical data			
Number of LED modules	1/2	1/2/4/8	1/2/3/5/6/10
Housing material		diffuser: transparent AC, body: dark grey ABS	
Colour temperature		3000/4000/5000/6500 K	
Dimmable		Dali (optional)	
Light angle		lambertian/narrow/wide/extra wide beam	
Rated luminous flux		1100-6800 lm	
Luminous efficacy	122-137 lm/W	122-143 lm/W	125-144 lm/W

The Method

Resistance to ammonia

The ammonia resistance of the LED light “NANOTTICA ABS” was determined by a laboratory test with two luminaires 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

For all test procedures, the LED light “NANOTTICA ABS” in the length of 615 mm and 1,455 mm have 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 outside the luminaire housing. 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 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 after the conducted tests.

Preservation of the luminous flux: After completion of the test the luminaire still had a luminous flux of 94,7 % (NANOTTICA ABS 1.2ft) and 94,5 % (NANOTTICA ABS 1.5ft).

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

Cleaning distance

Even at a cleaning distance of 15 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 15 cm should always be ensured.

Summary

The results show that the LED light "NANOTTICA ABS" fulfills the testing requirements for ammonia resistance and cleaning distance 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 LED light 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 15 cm during cleaning.

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

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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.

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Internal test code DLG: 2010-0013

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