

DLG Test Report 6906

Günther Spelsberg GmbH & Co. KG

GEOS series enclosures and accessories

Ammonia resistance



GÜNTHER SPELSBERG
GEOS SERIES ENCLOSURES
AND ACCESSORIES
✓ Ammonia resistance
DLG Test Report 6906



Overview

The DLG APPROVED quality mark for 'single, value-determining criteria' is awarded to technical products that have passed a less comprehensive DLG usability test which is carried out and evaluated to independent and approved criteria. The purpose of this test is to highlight a product's specific innovative and key features. The test is carried out to criteria that are laid down in the 'DLG Full Test' framework for technical products or may include further features and properties that confer a specific value to the product. DLG group of experts defines the minimum standards to be applied to the product and describes the test conditions and procedures as well as the criteria by which the test results are to be evaluated. These parameters reflect the acknowledged state of the art as well as scientific findings and agricultural insights and requirements. After a product has passed the test, a test report is produced and published and the quality mark is awarded to the product and will retain its validity for five years from the date of award.



The test on ammonia resistance was carried out at the lab to the patented DLG test standard. The aim of the test was to determine the suitability of the equipment for use in animal buildings and how the equipment performed when exposed to the climate inside animal buildings. The items and materials tested were new and recently manufactured. The testing scheme applied was the DLG protocol on the testing of ammonia resistance, version 07/2017.

No other criteria were tested in this test.

Assessment in brief

The materials supplied for the DLG Approved test were new and recently manufactured. They were tested for their ability to resist the stresses imposed by ammonia.

The results show that the materials meet all the requirements to pass this DLG test.

*Table 1:
Summary of test results*

Parameter tested: Ammonia resistance			
Component		Test result	Assessment*
GEOS series	Enclosures	resistant	+
MPI	Mounting plate	resistant	+
MPS	Mounting plate	resistant	+
L EP	Insert plate	resistant	+
ABL	Mounting bracket	resistant	+
MH	Bracket and base plate	resistant	+
L TW	Partition	resistant	+
NS35	Mounting bar	resistant	+
	Bel Air	resistant	+

* Evaluation range: + + / + / o / - / -- (o = standard)

The product

Manufacturer and applicant

Günther Spelsberg GmbH & Co. KG,
Im Gewerbepark 1, D-58579 Schalksmühle

The product:

GEOS series enclosures c/w accessories

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Description and specifications

All materials tested form part of the GEOS series enclosures.

Among other applications, the enclosure is installed in animal buildings where it may be exposed to higher concentrations of ammonia.

Table 2:

Specifications (manufacturer information)

Series GEOS enclosures		
Measured voltage	1000 V AC 1500 V DC	
Length	300–400 mm	
Width	300–500 mm	
Height	180–226 mm	
Accessories		Dimensions (Length x Width x Height)
MPI	Mounting plate	250–350 mm x 250–450 mm x 5 mm
MPS	Mounting plate	250–350 mm x 250–450 mm x 2–5 mm
L EP	Insert plate	276–376 mm x 276–476 mm x 4 mm
ABL	Mounting bracket	94,3 mm x 19,9 mm x 40 mm
MH	Bracket and base plate	74,9 mm x 31,6 mm x 155,5 mm
L TW	Partition	470 mm x 2,5 mm x 156 mm
NS35	Mounting bar	450 mm x 35 mm x 7,5 mm
	Bel Air	

The Method

Ammonia resistance

The ammonia resistance of the materials was determined in a lab test that was carried out to the DLG test standard for agricultural applications.

The DLG ammonia resistance lab test measures the ability of the sample to withstand the exposure to animal housing climates over a lifetime of up to 20 years.

To simulate these conditions and this time period, the sample was placed in a climate chamber where it was exposed to the following conditions:

Duration of the test	1500 h
Air temperature	70 °C
Relative humidity	70 %
Ammonia concentration	750 ppm

To assess the ability of the sample to resist NH_3 , the sample was visually inspected, weighed and its hardness was measured using the Shore durometer.

This procedure was applied to at least two samples of each product.

Detailed account of the test results

Ammonia resistance

The enclosures showed no signs of stress or damage by the NH₃ gas during the test, but the transparent cover lost its shiny finish. The finish seemed dull and the transparency declined visibly. However, this transformation does not affect the functionality of the enclosures, unless a specific application may require a flawless finish. Therefore the DLG assessed the cover as offering 'limited resistance'. In this context it should be pointed out that the test conditions are very accelerative to simulate long-term conditions and allow testers to make a statement on longevity.

However, in view of the fact that the transformation does not affect the functionality of the component and also in view of the fact that ammonia concentrations are much lower in reality the enclosures as a whole can be assessed as suitable for use in animal buildings. All other parameters tested were found to be within uncertainty or target range. Hence, we can conclude that the materials will sufficiently withstand exposure to NH₃ gas as it is the case in pig houses. The test was carried out at an ambient temperature of 70 °C and without an electric or data line being connected to the enclosures, hence without pressure compensation. The manufacturer says that a pressure compensation is provided by the feed line into the enclosures.

Table 3:
Impact of NH₃ on the enclosures

Component	visual inspection	Weight	Shore hardness	Assessment
Enclosures, grey cover with seal	not affected	< 1,0 %	< 3,0 %	resistant
Enclosures, transparent cover with seal	dull cloudiness	< 1,0 %	< 6,0 %	partially resistant
Series GEOS enclosures				resistant

Table 4:
Impact of NH₃ on the accessories

Accessories	visual inspection	Weight	Shore hardness	Assessment
MPI Mounting plate	no change	< 3,0 %	< 3,0 %	resistant
MPS Mounting plate	no change	< 3,0 %	not tested	resistant
L EP Insert plate	no change	< 3,0 %	< 3,0 %	resistant
ABL Mounting bracket	no change	< 3,0 %	< 6,0 %	resistant
MH Bracket and base plate	no change	< 3,0 %	< 6,0 %	resistant
L TW Partition	no change	< 3,0 %	< 3,0 %	resistant
NS35 Mounting bar	no change	< 3,0 %	not tested	resistant
Bel Air	no change	< 3,0 %	< 3,0 %	resistant

Summary

The results of the test show that the GEOS series c/w all accessories meets the DLG test requirement for ammonia resistance for receiving the DLG AP-PROVED quality mark (scoring "o" or better).

This suggests that the model range tested can be considered as resistant to ammonia loaded air in animal houses. No other criteria were tested in this test.

More information

Test implementation

DLG TestService GmbH, Gross-Umstadt location
The tests are conducted on behalf of DLG e.V.

Department

Agriculture

Division head

Dr. Ulrich Rubenschuh

DLG test scope

DLG Approved test "Ammonia resistance"
(date of issue 07/2018)

Test engineer

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.

Internal test code DLG: 2018-00062/2018-00442

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