

Günther Spelsberg GmbH & Co. KG

GEOS series with accessories

Ammonia resistance



**G. SPELSBERG
GEOS SERIES WITH
ACCESSORIES**

✓ **Resistance to ammonia**

DLG Test Report 7543

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.



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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.

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 (NH₃).

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

*Table 1:
Overview of results*

DLG QUALITY PROFILE	Evaluation*
Resistance to ammonia	■ ■ ■ ■ □

* DLG Evaluation range:

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

*Table 2:
Test results in detail*

Component		Test result
GEOS-L series	Enclosures	resistant
GEOS-S series	Switch cabinets	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

The Product

Manufacturer and applicant

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

The product:
GEOS series with accessories

Contact:
Telephone +49 (0)2355 892-0
Telefax +49 (0)2355 892-299
info@spelsberg.de
www.spelsberg.de

Description and specifications

All materials tested form part of the GEOS-L series enclosures and switch cabinets of GEOS-S series.

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

Table 3:
Specifications (manufacturer information)

Enclosures and switch cabinets of GEOS-L and GEOS-S series		
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 10 or 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 NH_3 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 'partially resistant'. 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 NH_3 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.

Tables 4-6 are showing the test results of the enclosures, accessories and colored materials.

Table 4:
Impact of NH_3 on the cabinets

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
Enclosures, grey door with seal	not affected	< 1,0 %	< 3,0 %	resistant
Enclosures, transparent door with seal	not affected	< 1,0 %	< 3,0 %	resistant
Framework, grey	not affected	< 1,0 %	< 3,0 %	resistant
GEOS series enclosures and switch cabinets				resistant

Table 5:
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

Table 6:
Impact of NH₃ on the material colors

Colors		visual inspection	Weight	Shore hardness	Assessment
grey, black	Enclosure GEOS-L	not affected	< 3,0 %	< 3,0 %	resistant
grey, transparent, black translucent, black	Cover GEOS-L	not affected	< 3,0 %	< 3,0 %	resistant
grey, black	Enclosure GEOS-S	not affected	< 3,0 %	< 3,0 %	resistant
grey, black	Framework GEOS-S	not affected	< 3,0 %	< 3,0 %	resistant
grey, transparent, black translucent, black	Door GEOS-S	not affected	< 3,0 %	< 3,0 %	resistant

Summary

The results of the test show that the GEOS series with all accessories meets the DLG test requirement for ammonia resistance for receiving the DLG APPROVED quality mark.

This suggests that the model range tested can be considered as resistant to ammonia loaded air in animal houses.

Weitere Informationen

Testing agency

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

Department

Farm Inputs

Division head

Dr. Michael Eise

DLG test framework

DLG APPROVED test frame work
"Ammonia resistance of stable components"
(date of issue 07/2023)

Test engineer

Dipl-Ing (FH) Tommy Pfeifer*

* Author

DLG. An 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 GEOS series with accessories was tested in 2018 and the results were initially published in test report 6906 and transferred to test report 7085 two years later. In 2025, the manufacturer applied for a test label extension. According to the manufacturer, the tested product is still being sold with unchanged properties.

Interne Prüfnummer DLG: 2504-0009

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DLG TestService GmbH

Groß-Umstadt location

Max-Eyth-Weg 1 • 64823 Groß-Umstadt • Germany

Phone +49 69 24788-600 • Fax +49 69 24788-690

Tech@DLG.org • www.DLG.org

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