

# DLG Test Report 7458

Günther Spelsberg GmbH & Co. KG

## Abox series with accessories

Resistance to ammonia



G. SPELSBERG  
ABOX SERIES WITH  
ACCESSORIES  
✓ Resistance to Ammonia  
DLG Test Report 7458



## 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 recognised 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 recognised 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 'Resistance to ammonia' test was conducted as a laboratory test according to the patented DLG test standard. The objective of this test is to determine whether barn installations can withstand the effects of stable air. Factory-new samples of all installed materials were tested. The test was based on the DLG test specification for investigating resistance to ammonia, version 07/2023. Other criteria were not tested.

## Assessment in brief

The as-new test samples were tested regarding their ammonia resistance according to DLG-APPROVED test methods.

The tested samples have met the requirements regarding the examined criteria.

*Table 1:*  
*Overview of results*

DLG QUALITY PROFILE	Test result	Evaluation*
<b>Single Criteria Resistance to Ammonia</b>		
Abox series up to size 100	resistant	■ ■ ■ ■
Abox series from size 160	partially resistant	■ ■ ■ □
Abox Pro series up to size 100	partially resistant	■ ■ ■ □
Abox Pro series from size 160	partially resistant	■ ■ ■ □
Abox accessories – Partition wall	resistant	■ ■ ■ ■
Abox accessories – Sealing kit	resistant	■ ■ ■ ■
Abox accessories – Insulating plugs	resistant	■ ■ ■ ■
Abox accessories – Terminal holder	resistant	■ ■ ■ ■
Abox accessories – Terminal block	resistant	■ ■ ■ ■
Abox accessories – Mounting plate	resistant	■ ■ ■ ■
Abox accessories – Double-membrane seals	resistant	■ ■ ■ ■
Abox accessories – Attachment bushes	resistant	■ ■ ■ ■
Abox accessories – Cable gland	resistant	■ ■ ■ ■

\* The DLG test framework specifies the following evaluation range:  
 ■ ■ ■ or better = meets or exceeds the specified DLG standard,  
 ■ ■ = meets the statutory requirements for marketing the product, ■ = failed

## The product

### Applicant and manufacturer

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

Product:

Abox series with accessories

Contact:

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### Description and technical data

The samples tested here are components of the junction box from the Abox series.

The box is also installed in animal houses, and can thus be exposed to elevated levels of ammonia in the housing environment.

Table 2:

Technical characteristics (according to manufacturer)

Junction box Abox series	Abox series	Abox Pro series
Rated voltage	1000 V AC 1000 V DC	1000 V AC 1000 V DC
Length	87–252 mm	92–252 mm
Width	87–252 mm	92–252 mm
Height	52–120 mm	60–120 mm
Accessories		Dimensions
TW	Partition wall	23 mm x 72 mm x 43,5 mm
PST	Sealing Kit	15 mm x 15 mm x 15 mm
Abox 100 KH 2006 6 <sup>2</sup>	Terminal holder TOPJOB	69 mm x 124 mm x 60 mm
Abox 160 KH 2010 10 <sup>2</sup>	Terminal holder TOPJOB	79 mm x 154 mm x 65 mm
Abox 250 KH 2016 16 <sup>2</sup>	Terminal holder TOPJOB	77 mm x 219 mm x 77 mm
Abox 025/040 KH 2273 2,5 <sup>2</sup>	Terminal holder Wago	23 mm x 70 mm x 27 mm
Abox 025/040 KH 221 4 <sup>2</sup>	Terminal holder Wago	23 mm x 56 mm x 29 mm
Abox 100 KH 221 4 <sup>2</sup>	Terminal holder Wago	22 mm x 88 mm x 32 mm
Abox 100 KH 221 6 <sup>2</sup>	Terminal holder Wago	26 mm x 114 mm x 32 mm
KLS-2,5 <sup>2</sup> /4 <sup>2</sup>	Terminal block	46,6 mm x 17,8 mm x 31,5 mm
MPI	Mounting plate	94 mm x 94 mm x 2,5 mm up to 217 mm x 217 mm x 2,5 mm
DMS	Double-membrane seals	
AST	Attachement bushes	
KVR	Cable gland	
	Insulating plugs Abox Pro	
	Insulating plugs Abox	

The enclosures of the Abox series up to size 100 are manufactured from polypropylene (PP); those of the Pro series up to size 100 are manufactured from polycarbonate (PC). As of size 160, both enclosure series are manufactured from glass fibre-reinforced PC.

## The method

### Resistance to ammonia

The ammonia resistance of the test samples was determined by a laboratory testing according to the DLG test standard for agricultural use.

With the DLG laboratory test for  $\text{NH}_3$  resistance, it is possible to determine the ability of the test sample to withstand the effects of animal house air over a usage period of about 10 years.

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

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

For assessing the  $\text{NH}_3$  resistance, the test samples were examined visually, gravimetrically and through a measurement of the material thickness before and after the climate testing.

The samples were tested on the basis of at least two samples.

## Detailed account of the test results

### Resistance to ammonia

Neither the empty enclosures of the Abox series up to size 100 nor the tested accessories revealed any anomalies during the test. The enclosures' different colours did not limit their functionality during the test. The tested empty enclosures of the Abox Pro series and the Abox series as of size 160 did not initially reveal any visual anomalies either. On installation and removal of the cover, however, moderate embrittlement of the material was ascertained. This embrittlement was largely confirmed by measuring the hardness. As the basic functionality was not limited, these test samples can be classified as partially resistant to ammonia. Despite this, moving the threaded connections of the cover in this series with corresponding care is recommended.

Since the deviations do not affect the functionality of the component and significantly lower ammonia concentrations often occur in practice, the entire empty enclosure can nevertheless be assessed as essentially suitable. All other deviations in the measured parameters lay within the measurement uncertainty or the assessment limits. It is therefore to be assumed that the materials can essentially withstand an  $\text{NH}_3$ -laden atmosphere such as that encountered in the exhaust air of pig houses.

The results for the enclosures, accessories and colours are shown in Tables 3 to 5.

Table 3:

*Impact of  $\text{NH}_3$  on the enclosures*

Component		Visual assessment	Weight	Shore hardness	Evaluation
Abox	Box (size 025 to 100), grey cover with seal	no change	< 1.0 %	< 3.0 %	resistant
Abox	Box (size 160 to 350), grey cover with seal	Embrittlement	< 1.0 %	< 3.0 %	partially resistant
Abox Pro	Box (size 025 to 100), grey cover with seal	Embrittlement	< 1.0 %	< 5.0 %	partially resistant
Abox Pro	Box (size 160 to 350), grey cover with seal	Embrittlement	< 1.0 %	< 5.0 %	partially resistant
<b>Abox series empty enclosures</b>					<b>resistant</b>

Table 4:  
Impact of  $NH_3$  on the accessories

Accessories		Visual assessment	Weight	Shore hardness	Evaluation
Partition wall	Abox	no change	< 1.0 %	not tested	resistant
Sealing Kit	Abox	no change	< 6.0 %	not tested	resistant
Insulating plugs	Abox	no change	< 1.0 %	not tested	resistant
Insulating plugs	Abox Pro	no change	< 1.0 %	not tested	resistant
Terminal holder TOPJOB	Abox	no change	< 1.0 %	not tested	resistant
Terminal holder TOPJOB	Abox Pro	no change	< 1.0 %	not tested	resistant
Terminal holder ELS	Abox	no change	< 1.0 %	not tested	resistant
Terminal holder ELS	Abox Pro	no change	< 1.0 %	not tested	resistant
Terminal holder WAGO 1	Abox	no change	< 1.0 %	not tested	resistant
Terminal holder WAGO 1	Abox Pro	no change	< 1.0 %	not tested	resistant
Terminal holder WAGO 2	Abox	no change	< 1.0 %	not tested	resistant
Terminal holder WAGO 2	Abox Pro	no change	< 1.0 %	not tested	resistant
Terminal block	Abox	no change	< 1.0 %	not tested	resistant
Terminal block	Abox Pro	no change	< 1.0 %	not tested	resistant
Mounting plate	Abox	no change	< 1.0 %	< 1.0 %	resistant
Mounting plate	Abox Pro	no change	< 1.0 %	< 1.0 %	resistant
Double-membrane seals	Abox Pro	no change	< 1.0 %	not tested	resistant
Attachment bushes	Abox	no change	< 3.0 %	not tested	resistant
Attachment bushes	Abox Pro	no change	< 3.0 %	not tested	resistant
Cable gland	Abox	no change	< 3.0 %	not tested	resistant
Cable gland	Abox Pro	no change	< 3.0 %	not tested	resistant
<b>Accessories of the Abox series</b>					<b>resistant</b>

Table 5:  
Impact of  $NH_3$  on the sample colors

Colors		Visual assessment	Weight	Shore hardness	Evaluation
Black, white	Abox Pro	Embrittlement	< 1.0 %	< 5.0 %	partially resistant
Cover red	Abox Pro	Embrittlement	< 1.0 %	< 3.0 %	partially resistant
Black, white	Abox	no change	< 1.0 %	< 3.0 %	resistant
Cover red	Abox	no change	< 1.0 %	< 3.0 %	resistant
<b>Colors of the Abox series</b>					<b>resistant</b>

## Summary

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

As a result of this, it can be assumed that the tested series is to be classified as resistant to ammonia-laden barn air. The moderate embrittlement of those empty enclosures that are manufactured from polycarbonate does not limit the basic functionality.

## Further information

### Testing agency

DLG TestService GmbH,  
Gross-Umstadt location, Germany

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

### Department

Farm Inputs

### Devision head

Dr. Michael Eise

### DLG test framework

“Resistance of stable components to ammonia”  
(status 07/2023)

### Test engineer(s)

Dipl.-Ing (FH) Tommy Pfeifer\*

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\* 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.

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