DLG Test Report 6398

G. Spelsberg GmbH & Co. KG

Junction box of the Abox-i series with accessories

Resistance to ammonia

www.DLG-Test.de

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 valuation 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 DLG-APPROVED test „Ammonia resistance“ includes technical examinations in the laboratory and in the NH_3 test chamber of the DLG Test Center Technology and Farm Inputs in Gross-Umstadt.

Brand-new samples of all materials used were tested. The testing was based on the DLG test specification for the study of ammonia resistance, version 2.0/2012.

Other criteria were not tested.

Evaluation – short version

The brand-new materials are tested regarding their ammonia resistance according to DLG-APPROVED test methods.

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

Table 1: Overview of results

Test criterion “resistance to ammonia”			
Component		Test result	Evaluation
Abox-i	junction box	resistant	+
SNI	stepped nipple	resistant	+
AST	attachment spout	resistant	+
BST	ventilation spout	resistant	+
DMS	double membrane spout	resistant	+
DMS/sw	double membrane spout	resistant	+
	insulating plug	resistant	+

The product

Applicant and manufacturer

G. Spelsberg GmbH + Co. KG
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Product:
Junction box
Abox-i series with accessories

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Description and technical data

The materials tested here are components of the junction box from the Abox-i 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-i series		
Rated voltage		690 V
Rated current		57 A (125 A)
Length		110 – 250 mm
Width		110 – 250 mm
Height		67 – 115 mm
Partitioning units		6^2 – 35^2 mm
Accessories		**Dimensions (L x W x H)**
SNI	stepped nipple	Ø 30 x 20 mm
AST	attachment spout	Ø 30 x 23 mm
BST	ventilation spout	Ø 25.5 x 13 mm
DMS	double membrane spout	Ø 25.5 x 14 mm
DMS/sw	double membrane spout	Ø 30 x 15 mm
	insulating plug	Ø 14 x 5 mm

The method

Picture 2: DLG test lab – two ammonia chambers

Resistance to ammonia

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

With the DLG laboratory test for 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 at least 20 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 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 measurement of shore hardness only yielded relevant and tangible results for the accessory parts. The materials were tested on the basis of at least two samples.

The test results in detail

Resistance to ammonia

During the test, all tested components and materials were resistant.

No visual or functional properties of the materials were restricted after the fumigation in the ammonia-containing environment.

All deviations of the measured parameters were within the measurement uncertainty or the evaluation thresholds. Thus, it can be assumed that the materials are able to sufficiently withstand a NH_3-containing atmosphere, as it would be the case for exhaust air in pig houses for example.

Table 3: Change through the NH_3 exposure - junction box

Component	Visual assessment	Weight	Width	Height	Thickness	Evaluation
Box/cover with seal and screw	no change	0.2 %	-0.5 %	0.7 %	–	resistant
Double membrane spout	no change	-0.8 %	–	–	< 0.1 %	resistant
Junction box Abox-i series						**resistant**

Table 4: Change through the NH_3 exposure - accessories

Accessories		Visual assessment	Weight	Shore hardness	Evaluation
SNI	stepped nipple	no change	< 3.0 %	< 5.0 %	resistant
AST	attachment spout	no change	< 3.0 %	< 5.0 %	resistant
BST	ventilation spout	no change	< 3.0 %	< 5.0 %	resistant
DMS	double membrane spout	no change	< 3.0 %	< 5.0 %	resistant
DMS/sw	double membrane spout	no change	< 3.0 %	+ 6.5 %	resistant
	insulating plug	no change	< 3.0 %	< 5.0 %	resistant

Conclusion

The brand-new materials were tested regarding their ammonia resistance in the laboratory and in the NH_3 test chamber of the DLG Test Center Technology and Farm Inputs in Gross-Umstadt according to DLG-APPROVED test methods. All tested materials have met the requirements regarding the examined criteria. Thus, the entire component is to be classified as resistant to ammonia-containing air.

More information

Further test results on animal housing equipment can be downloaded at **www.dlg-test.de/stallein-richtungen**.

The competent DLG professional committees have published information leaflets on various topics. These are available at **www.dlg.org/merkblaetter.html** in PDF format free of charge.

Test performed by

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DLG test framework

DLG test specification “Ammonia resistance”, version 2.0/2012

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The DLG

In addition to being the executing body of well-known tests for agricultural engineering, farm inputs and foods, DLG is also an open forum for the exchange of knowledge and opinions in the agricultural and food industry.

Some 180 full-time employees and more than 3,000 volunteer experts are developing solutions to current problems. The more than 80 committees, working groups and commissions thereby form the basis of expertise and continuity in the technical work. At DLG, a great deal of specialist information for agriculture is created in the form of information leaflets and working papers, as well as articles in journals and books.

DLG organises the world‘s leading professional exhibitions for the agriculture and food sector. This contributes to the transparent presentation of modern products, processes and services to the public.

Secure the knowledge edge as well as other benefits, and contribute to the expert knowledge base in the agricultural industry! Further information can be obtained under www.dlg.org/mitgliedschaft.

The DLG Test Center Technology and Farm Inputs

The DLG Test Center Technology and Farm Inputs in Gross-Umstadt is the benchmark for tested agricultural products and farm inputs, as well as a leading testing and certification provider for independent technology tests. The DLG test engineers precisely examine product developments and innovations by utilizing state-of-the-art measurement technology and testing methods gained from practice.

As an accredited and EU-registered testing laboratory the DLG Test Center Technology and Farm Inputs offers farmers and practitioners vital information and decision support for the investment planning for agricultural technology and farm inputs through recognized technology and DLG tests.

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