DLG Test Report 7240

G. Spelsberg GmbH & Co. KG

Empty housing of the TK PC series with accessories

Resistance to ammonia

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 2.4/2021.

Other criteria were not tested.

Assessment in brief

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.

Tabelle 1:
Ergebnisse im Überblick

DLG QUALITY PROFILE		Test result	Evaluation*
Single Criteria Resistance to Ammonia			
Component – TK PC Serie	installation distribution board	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 DLG test framework provides the following options in its evaluation schemes:
■ ■ ■ or better = meets, exceeds or clearly exceeds the specified DLG standard, ■ ■ = meets the legal requirements for marketability, ■ = failed

The Product

Applicant and manufacturer

G. Spelsberg GmbH + Co. KG
Im Gewerbepark 1
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Product:
Empty housing Series TK PC with accessories

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Description and technical data

The materials tested here are components of the empty housing of the TK PC series (TK PC 55 to TK PC 3625).

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

Table 2:
Technical characteristics (according to manufacturer)

Empty housing series TG PC		
Rated voltage		690 V
Length		52 - 361 mm
Width		50 - 254 mm
Height		35 - 165 mm
Accessories		**Dimensions**
SNI	stepped nipple	Ø 30 mm x 20 mm
AST	attachment spout	Ø 30 mm x 23 mm
BST	ventilation spout	Ø 25,5 mm x 13 mm
DMS	double membrane spout	Ø 25,5 mm x 14 mm
DMS/sw	double membrane spout	Ø 30 mm x 15 mm
	insulating plug	Ø 14 mm x 5 mm

The Method

Figure 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 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 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.

Detailed account of the test results

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.

Table 3:
Change through the NH_3 exposure – empty housing

Component	Visual assessment	Weight	Thickness	Evaluation
Box/cover grey with seal	no change	0.2 %	–	resistant
Cover blue transparent with seal	no change	0.2 %	0.9 %	resistant
Cover screw A	no change	2.3 %	3.8 %	resistant
Cover screw U	no change	1.5 %	< 0.1 %	resistant
Empty housing series TK PC				**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

Summary

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.

Further information

Testing agency

DLG TestService GmbH,
Gross-Umstadt location, Germany

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

DLG test framework

DLG test specification
“Ammonia resistance”, for light systems and stable equipments (version 2.4/2021)

Department

Agriculture

Division head

Dr. Ulrich Rubenschuh

Test engineer(s)

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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: 2201-0013 (replaces DLG test report 6399)

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