

DLG Test Report 7241

G. Spelsberg GmbH & Co. KG

Empty housing of the TG PC series with accessories

Resistance to ammonia



G. SPELSBERG
EMPTY ENCLOSURE SERIES
TG PC WITH ACCESSORIES
✓ Resistance to Ammonia
DLG Test Report 7241



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.



The DLG-APPROVED test “Ammonia resistance” includes technical examinations in the laboratory and in the NH₃ 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.

Table 1:
Overview of results

| DLG QUALITY PROFILE | | Test result | Evaluation* |
|--|-----------------------|-------------|-------------|
| Single Criteria Resistance to Ammonia | | | |
| Component – TK PC Serie | empty housing | 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

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Product:
Empty housing Series TG PC with accessories

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Description and technical data

The materials tested here are components of the empty housing of the TG PC series (TG PC 88 to TG PC 3023).

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 | | 84 - 302 mm |
| Width | | 84 - 232 mm |
| Height | | 55 - 110 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 |



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

The transparent cover showed visual deviations during the test: it lost its shiny appearance through the NH_3 exposure. The surface became dull and appeared fogged. However, this does not restrict its functionality as long as there is no need for an optically flawless surface. The cover is therefore only classified as having a limited resistance. However, the acceleration of the test is very high, to be able to give a statement about an application period which is as long as possible.

Because the deviations do not affect the functionality of the component, and a significantly lower ammonia exposure occurs in practice, the overall empty enclosure can still be fundamentally assessed as suitable.

All other 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 – empty housing

| Component | Visual assessment | Weight | Thickness | Evaluation |
|-----------------------------------|---------------------|--------|-----------|-------------------------|
| Box grey with screw | no change | 0.1 % | 3.1 % | resistant |
| Box white with screw | no change | 0.1 % | < 3.0 % | resistant |
| Cover grey with seal | no change | 0.1 % | 3.0 % | resistant |
| Cover white with seal | no change | 0.1 % | < 3.0 % | resistant |
| Cover transparent | dull finish, fogged | 0.3 % | < 1.0 % | conditionally resistant |
| Empty housing series TG 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 at DLG 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 6400)

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