DLG Test Report 7448

**Oberleitner Windschutz GmbH & Co. KG**

# Sand Bed Grid SANDA®

Deformability/Elasticity,
Permanent Tread Load

## 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 Appoved Test “Deformability/Elasticity, Permanent Tread Load” includes technical measurements on test stands of the DLG Test Center. The deformability and elasticity were measured and a permanent tread load was applied. The test was based on the DLG Testing Framework for elastic stable flooring, as of December 2018 and DIN 3763:2022-08 (Elastic floorings for cattle and dairy cows walking and rest surfaces – Requirements and testing).

Other criteria were not investigated.

## Assessment in brief

The SANDA sand bed grid tested here, a system module for creating a lying surface in cubicle stables for cows and cattle, has been tested in the DLG-approved individual criteria test on test benches for durability and durability and comfort properties investigated.

Requirements of DIN 3763 are fulfilled for the tested criteria.
Deformation and Elasticity corresponds to class 2 DIN 3763.

*Table 1:*
*Overview of results*

| DLG QUALITY PROFILE | Evaluation* |
|---|---|
| Deformability and elasticity in new condition | ■ ■ ■ ■ ■ |
| Deformability and elasticity following endurance test | ■ ■ ■ ■ □ |
| No lasting deformation on the grid | ■ ■ ■ ■ ■ |
| Low wear on the webs of the grid | ■ ■ ■ □ □ |

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

## The product

### Manufacturer and Applicant

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Germany

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Sand bed grid SANDA

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### Description and technical data

The SANDA sand bed grid tested here is a system module for creating a lying surface in high boxes in cubicle stables for cows and cattle.

- Black rubber sand bed grid with 24 openings (dimensions of the openings: approx. 5.5 cm x 15 cm).
- 4 grids are required per cubicle.
- The 24 openings per grid are filled with damp slurry or unwashed cable sand.
- The surface of the grids should be overfilled and compacted about 3 cm with moist sand. Approx. 5 cm of litter should be applied to the solidified surface.
- The 4 grids per cubicle are laid floating.
- Dimensions of the grid: length 80 cm, width 60 cm, height 10 cm
- Weight: 26,5 kg
- Shore A hardness: 65

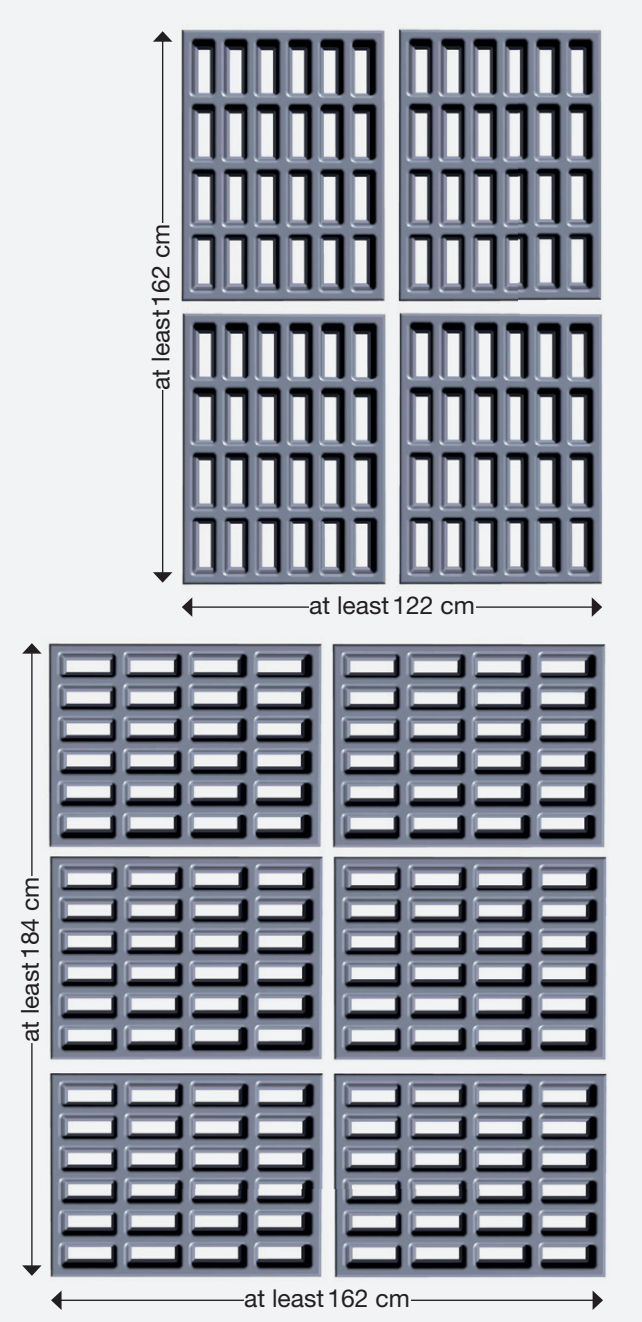


*Figure 2:*
*Installation variants*

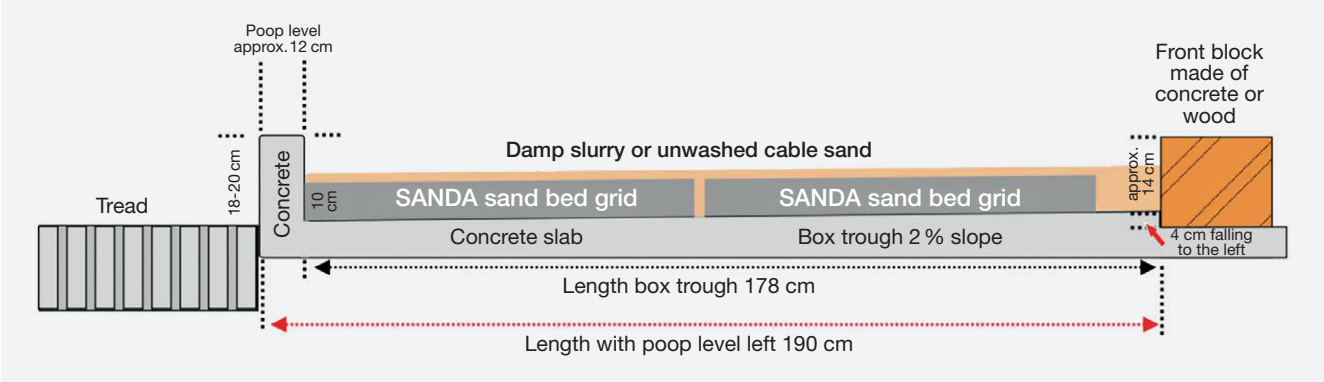


*Figure 3:*
*System sketch SANDA sand bed honeycomp*

## The method

### Deformability and elasticity

The deformability is measured in new condition and following permanent tread load using ball penetration tests with a calotte (r = 120 mm) and a penetration force of 2,000 N (corresponding to approx. 200 kg).

### Permanent tread load

The permanent tread load is measured on a test stand with a round steel foot in the standard test programme with 100,000 alternating loads at 10,000 N (corresponding to approx. 1,000 kg).

The steel foot is adapted to the natural conditions as an “artificial cow foot”. The foot has a diameter of 105 mm and therefore a contact area of 75 cm²; the carrying edge of the hoof is simulated by a 5 mm wide ring on the periphery of the sole that projects 1 mm above the rest of the surface.


*Figure 4:*
*Measurement of deformability with straw pellet bedding in new condition*

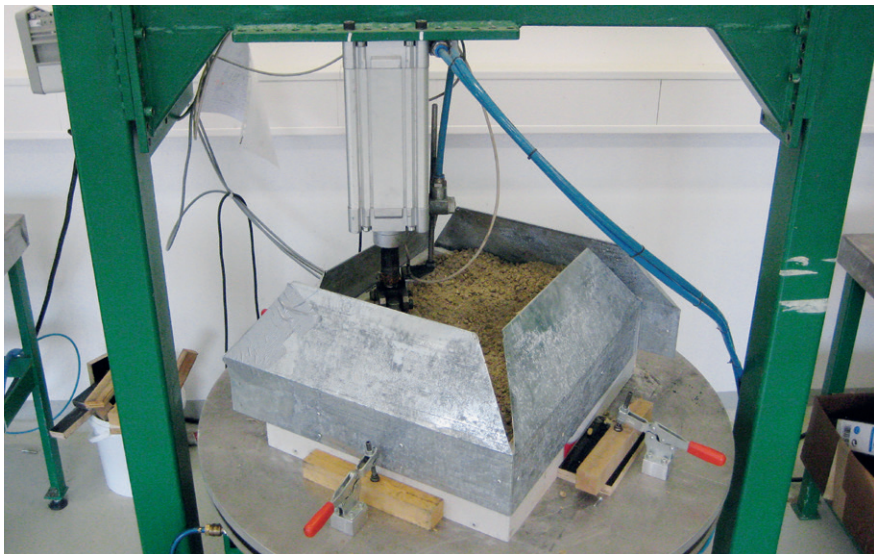

*Figure 5:*
*Permanent tread load test*

## Detailed account of the test results

### Deformability and elasticity

In the ball penetration tests in new condition with a calotte (r = 120 mm), penetration depth was 28.9 mm with 5 cm straw pellet bedding. The resulting calculated bearing pressure of 9.2 N/cm² indicates a very low load on the carpal joints when lying down and getting up.

Elasticity was measured following a permanent tread load exerted by a steel foot (contact area: 75 cm²) with 100,000 alternating loads at 10,000 N. Following the endurance test, the penetration depth of the calotte decreased from 28.9 mm to 10.4 mm. The bearing pressure increased from 9.2 N/cm² to 25.5 N/cm² (see Fig. 5).

This means that deformability and elasticity decrease.

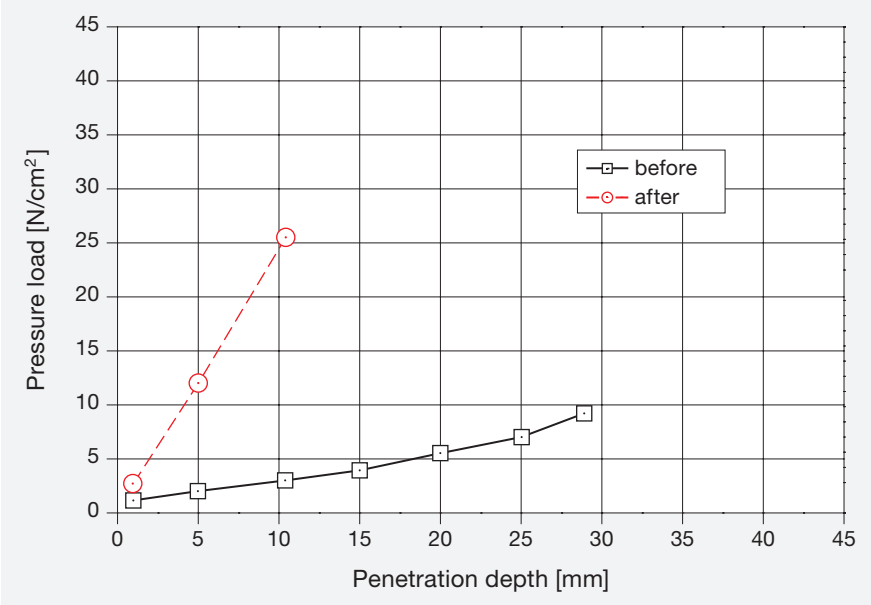


*Figure 6:*
*Deformability as a function of bearing pressure before and after permanent tread load*

### Permanent tread load

After continuous tread loading on a test bench with 100,000 alternating loads at 10,000 N, wear was detected on the webs of the grid.

A permanent deformation at the honneycomb cannot be determined.


*Figure 7:*
*Measurement of deformability after permanent tread load*

## Summary

Based on test-stand investigations, the criteria tested in this DLG Approved Test evaluate the comfort and durability properties of the SANDA sand bed grid for use in the resting area of high cubicles in cubicle houses. The tested SANDA sand bed honeycomp met the requirements of DIN 3763 and the DLG Testing Framework with respect to the investigated criteria.

Deformation and Elasticity corresponds to class 2 DIN 3763.

## 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 Testing Framework for elastic stable flooring, as of December 2018

DIN 3763:2022-08 (Elastic floorings for cattle and dairy cows walking and rest surfaces – Requirements and testing)

**Department**

Agriculture

**Division head**

Dr. Michael Eise

**Test engineer(s)**

Dr. Harald Reubold*

* Author

## 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.

In 2018, the SANDA® sand bed grid received the DLG-approved test mark. The results presented in the report are based on DLG Test Report No. 6911. According to the manufacturer, the sand bed grid is produced unchanged in the tested version.

Internal test code DLG: 2301-0043


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