DLG-Test Report 6765

Animat Inc.

Alley Mat Transition Mat

Deformability/Elasticity, Permanent Tread Load, Abrasion, Slip resistance, Cleaning distance

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ANIMAT ALLEY MAT TRANSITION MAT

- ✓ Deformability/Elasticity
- ✓ Permanent Tread Load
- ✓ Abrasion
- ✓ Slip resistance
- ✓ Cleaning distance

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www.DLG-Test.de

Overview

A quality mark “DLG-APPROVED for single value-determining criteria” is awarded to agricultural products which successfully passed a smaller-scope DLG usability test according to independent and recognized evaluation criteria. The test intends to highlight special innovations and key criteria of the test item. The test can focus on criteria from the DLG testing framework for full tests or on other individual features or qualitative criteria. The minimum requirements, the test conditions and procedures as well as the evaluation guidelines of the test results are determined in consultation with a DLG expert group. They comply with the generally recognized technology rules as well as with scientific and agricultural knowledge and requirements. The successful test concludes with the publishing of a test report and the awarding of a quality mark which is valid for five years following the award date.

The DLG-APPROVED Test “Deformability/Elasticity, Permanent Tread Load, Abrasion, Slip resistance, Cleaning distance” includes technical measurements on test benches of the DLG Test Center. The deformability and elasticity, the abrasion resistance, the slip resistance, the cleaning distance were measured and a permanent tread load was applied. The test was based on the DLG Testing Framework for elastic stable flooring, as of April 2015. Other criteria were not investigated.

Assessment – Brief Summary

The Animat alley mat Transition Mat tested here, an elastic floor for walking ways in cubicle houses, was investigated with regard to durability and comfort properties on test benches in the DLG-APPROVED Test. The deformability and elasticity, the abrasion resistance, the slip resistance, the cleaning distance were measured and a permanent tread load was applied. The deformability and elasticity in new condition and following permanent tread load were better than the standard.

Table 1:
Overview of results

Test characteristic	Test result	Bewertung*
Deformability and elasticity		
– in new condition	2.0 mm, good	+
– following endurance test	2.1 mm, good	+
Permanent tread load		
	no lasting deformation	+ +
	no noticeable wear	+
Abrasion test		
	good resistance	+
Slip resistance **		
	good slip resistance on dry and wet mat surface	+
Cleaning distance		
	20 cm with flat jet nozzle	○
	45 cm with a coarse dirt remover	○

* Evaluation range: + + / + / ○ / – / – – (○ = standard, n/a = not applicable/evaluated)
** Evaluation range: + / –

The Product

Manufacturer and Applicant

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Product:
Alley mat Transition Mat

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Description and Technical Data

The Animat alley mat Transition Mat tested here is an elastic floor for walking ways in cubicle houses.

Black rubber mat

- thickness: approx. 19.7 mm
- upper side with T-structure
- lower side with bars and grooves
  - height of the bars approx. 6 mm
  - width of the bars approx. 5 mm
  - width of the grooves: approx. 6 mm
- Shore A hardness: approx. 70
- Laid as single mat

The Method

Deformability and elasticity

The deformability is measured in new condition and following permanent tread load with a round steel foot (diameter of 105 mm and therefore a contact area of 75 cm²) 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 bench with a round steel foot in the standard test programme with 250,000 alternating loads at 5,000 N (corresponding to approx. 500 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.

Abrasion test

In a standardised abrasion test with 10,000 cycles the top cover was grinded with an emery cloth (granulation 280) and a grinding pressure of 500 N (= 8.13 N/cm² surface pressure).

The friction element was cooled continuously with water to prevent an influence of the generated heat during the abrasion test. The size of the grinded area was 61.5 cm².

Slip resistance

The measurements were carried out with the Comfort Control test rig of the DLG Test Center.

A loaded (10 kg) round plastic foot (105 mm diameter, with a contact area of 75 cm², 3 mm wide ring at the periphery of the ground) was pulled with a velocity of 20 mm/s across the mat.

Cleaning distance

In test bench trials with a high pressure cleaner (approximately 145 bar, exposure period 1 minute with a 25° flat jet nozzle and a coarse dirt remover) the distance was measured where no damage occurs.

The Test Results in Detail

Deformability and elasticity

In the penetration test in new condition with a round steel foot (artificial cow foot) having a diameter of 105 mm (contact area 75 cm², with a 5 mm wide ring at the periphery of the sole, which projects 1 mm over the rest of the surface [carrying edge of the claw]) and a penetration force of 2,000 N (corresponding to approx. 200 kg), the penetration depth was 2.0 mm. This results in a calculated surface pressure of 26.67 N/cm².

Elasticity was measured after the Transition Mat had been exposed to a permanent tread load exerted by the steel foot (250,000 alternating loads of 5,000 N). After the endurance test, the penetration depth increased to 2.1 mm (see Fig. 2). This means that deformability and elasticity increase slightly.

Evaluation see table 1.

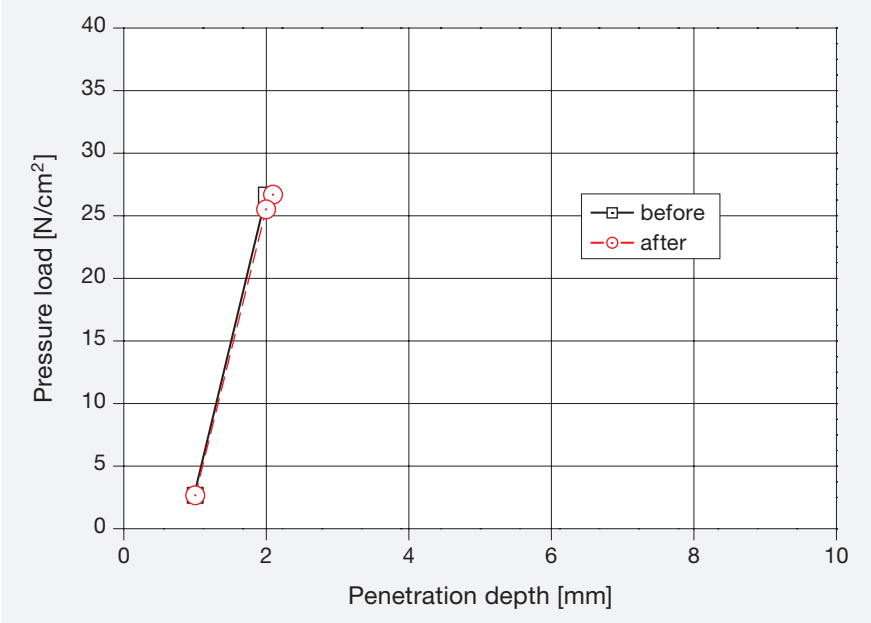

Figure 2:
Deformability of the rubber inlays depending on the pressure load

Permanent tread load

After the Transition Mat had been exposed to a permanent tread load exerted with 250,000 alternating loads of 5,000 N (corresponding to approx. 500 kg), the mat showed no noticeable wear. Lasting deformation could not be observed.

Evaluation see table 1.

Figure 3:
Deformation measurement

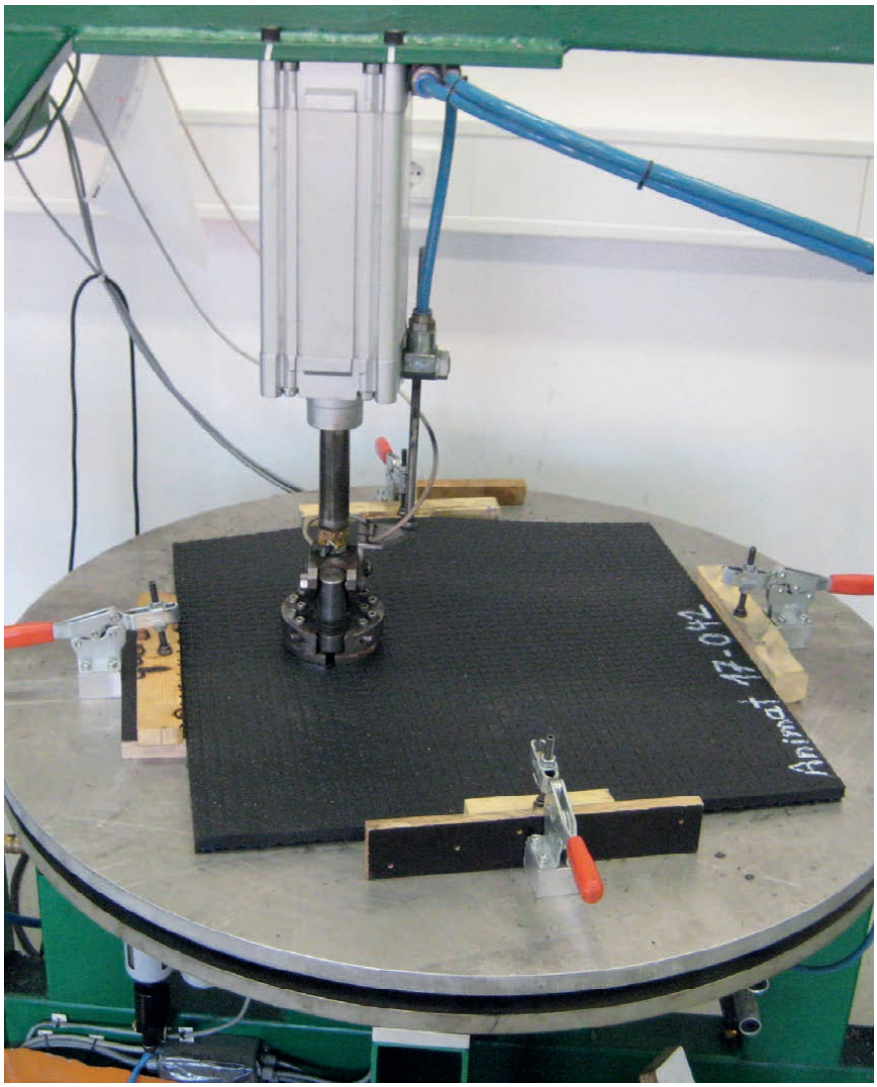

Figure 4:
Permanent tread load test

Figure 5:
Test sample after abrasion test

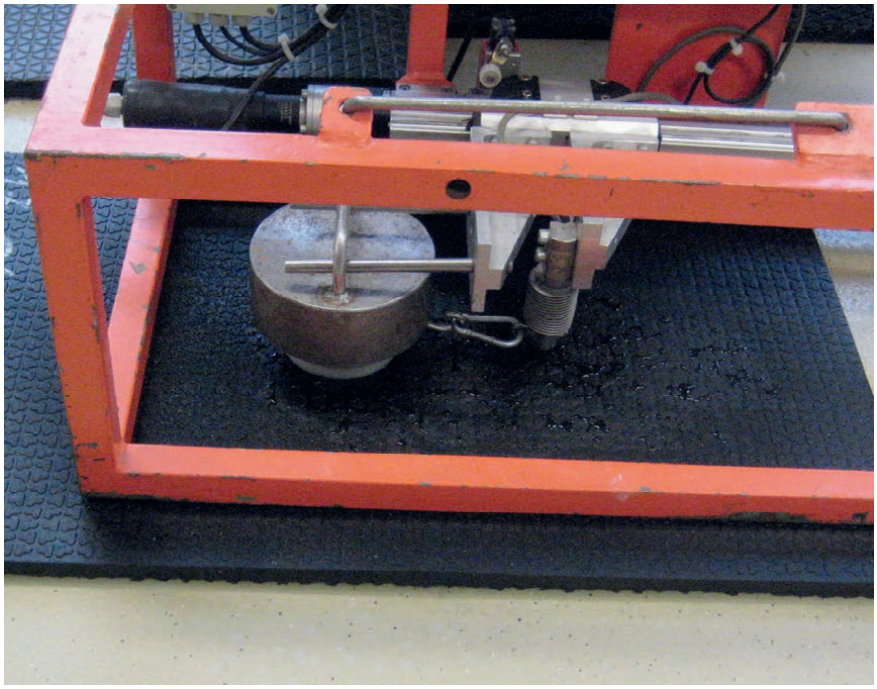

Figure 6:
Slip resistance measurement

Abrasion test

The abrasion depth after 10,000 cycles amounted to 2.4 mm, this corresponds to approximately 12 % of the mat thickness.

From the ground surface 13.5 grams were rubbed off.

Evaluation see table 1.

Slip resistance

The slide pulling tests showed a good slip resistance on the dry or wet mat surface in new condition.

The measured friction coefficients (μ) all surpassed the minimal value of μ = 0.45 which speaks for a good foothold.

Evaluation see table 1.

Cleaning distance

In test bench trials with a high pressure cleaner damage to the mat only occurred when a minimum distance of 45 cm (with a coarse dirt remover) and 20 cm (with a flat jet nozzle) was not kept.

For cleaning and disinfection of the floor cover only the cleaning agents permitted by the manufacturer should be used.

Evaluation see table 1.

Summary

Based on test bench investigations, the criteria tested in this DLG-APPROVED Test evaluate the comfort and durability properties of the Animat alley mat Transition Mat for use in the walking ways in cubicle houses.

The tested Animat alley mat Transition Mat met the requirements of the testing framework with respect to the investigated criteria.

More information

Further test results for alley mats are available for download at **www.dlg-test.de/stalleinrichtungen**.

The relevant DLG committees have published various instruction leaflets on the topics of animal welfare and cattle farming. These are available free of charge in PDF format at **www.dlg.org/merkblaetter.html**.

Test performed by

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DLG test scope

DLG-APPROVED single criteria test
“Elastic Stable Flooring”
(current as of 04/2015)

Department

Indoor operations

Head of Department

Graduate engineer agr Susanne Gäckler

Test engineer(s)

Dr Harald Reubold*

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The DLG

In addition to being the executing body of well-known tests for agricultural engineering, farm inputs and foods, the 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 committees thereby form the basis of expertise and continuity for the professional work. At the 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 competitive edge as well as other benefits, and contribute to the expert knowledge base of 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 service 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 tests and DLG testing.

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