

Animat Inc.

Alley Mat IRON GRIP

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



ANIMAT ALLEY MAT IRON GRIP

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

DLG Test Report 7555

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 “Deformability/Elasticity, Permanent Tread Load, Abrasion, Slip resistance, Cleaning distance” includes technical measurements on test stands 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 Frameworks 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 Animat alley mat IRON GRIP tested here, an elastic floor for walking ways in cubicle houses, was investigated with regard to durability and comfort properties on test stands 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 standard.

Requirements DIN 3763 are fulfilled for the tested criteria.

Table 1:
Overview of results

DLG QUALITY PROFILE	Evaluation
Walking measurement deformability and elasticity in new condition	■ ■ ■ ■ □ *
Walking measurement deformability and elasticity following endurance test	■ ■ ■ ■ □ *
Lasting deformation following 250.000 endurance test	■ ■ ■ ■ ■ *
No noticeable wear and no damage following 250.000 endurance test	■ ■ ■ ■ □ *
Slip resistance	■ ■ **
Abrasion/Wear resistance	■ ■ ■ □ □ *
Cleaning distance with flat jet nozzle	■ ■ ■ □ □ *
Cleaning distance with a coarse dirt remover	■ ■ ■ □ □ *

DLG Evaluation range:

* ■ ■ ■ or better = meets, exceeds or significantly exceeds the established DLG standards,

■ ■ = meets the legal requirements for marketability, ■ = failed

** Single criteria slip resistance: ■ ■ = passed, ■ = failed

The product

Manufacturer and Applicant

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Alley Mat IRON GRIP

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Description and Technical Data

The Animat alley mat IRON GRIP tested here, an elastic floor for walking ways in cubicle houses.

Black rubber mat

- thickness approx. 26 mm
- upper side: with rhomb structure (rhomb: high: 4.5mm, length: 28 mm, width: 19 mm)
- under side: no structure
- Shore A hardness: approx. 72
- laid as single mat

The method

Deformability and elasticity

The deformability is determined in new condition and after the continuous tread load with a cow's foot modeled steel base and a penetration force of 2,000 N (approx. 200 kg). Where: the "artificial cow's foot" in its dimensions is the one used in the continuous tread load.

Permanent tread load

The measurement of the continuous tread load is carried out with 250,000 alternating loads at 5,000 N (corresponds to approx. 500 kg) on a test bench with a round steel foot.

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 (= 8.1 N/cm² surface pressure). The friction element was cooled continuous 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 ComfortControl test rig of the DLG test centre.

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 stand 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.

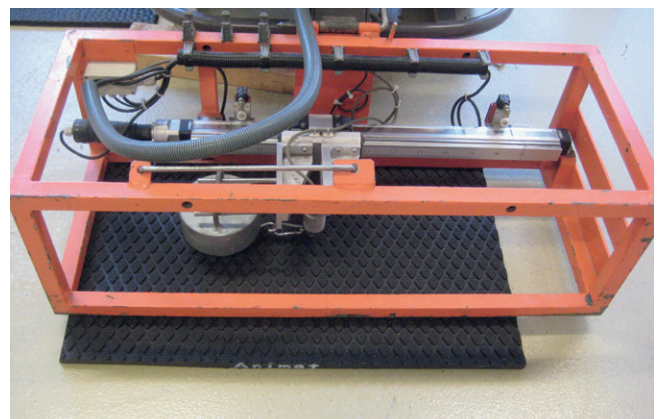


Figure 2:
Slip resistance measurement

Detailed account of the test results

Deformability and elasticity

In the penetration test in new condition with a round steel foot (artificial cow's 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 ca. 200 kg), penetration depth was 4.0 mm. This results in a calculated surface pressure of 26.7 N/cm².

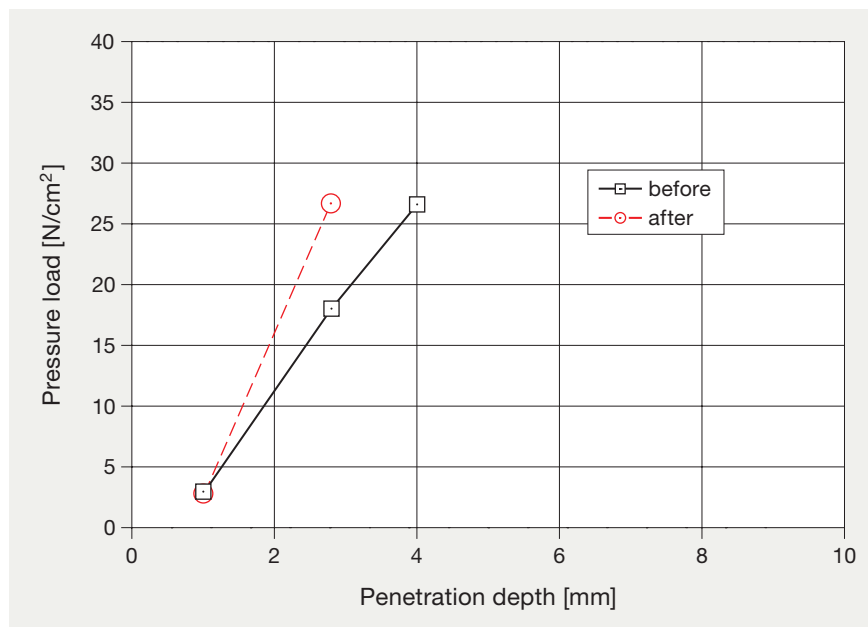


Figure 3:
Deformability as function of bearing pressure

Elasticity was measured after the IRON GRIP 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 of the mat reduced to 2.8 mm (see Fig. 3).

Permanent tread load

After the IRON GRIP mat had been exposed to a permanent tread load exerted with 250.000 alternating loads of 5.000 N (corresponding to ca. 500 kg), the mat showed no noticeable wear. Lasting deformation could not be observed.

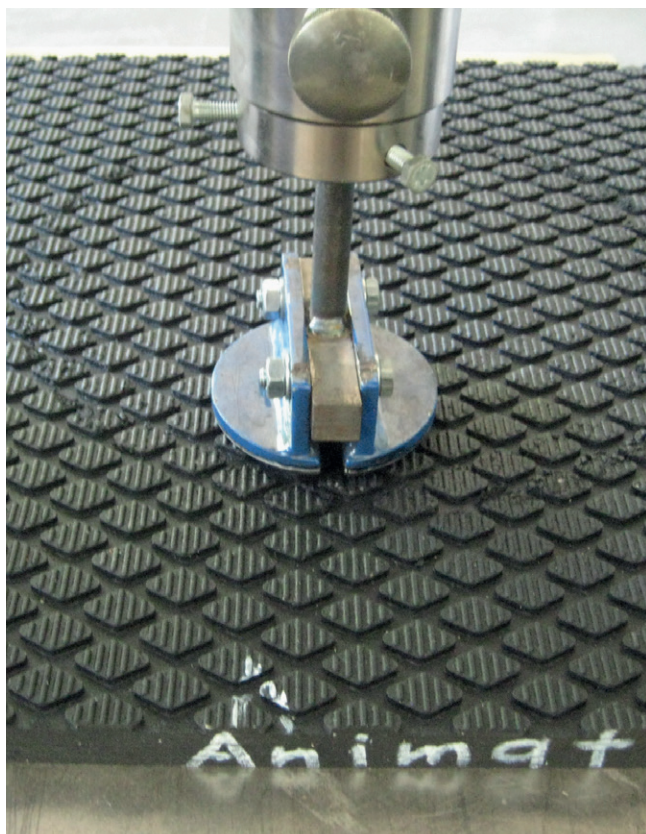


Figure 4:
Deformation measurement

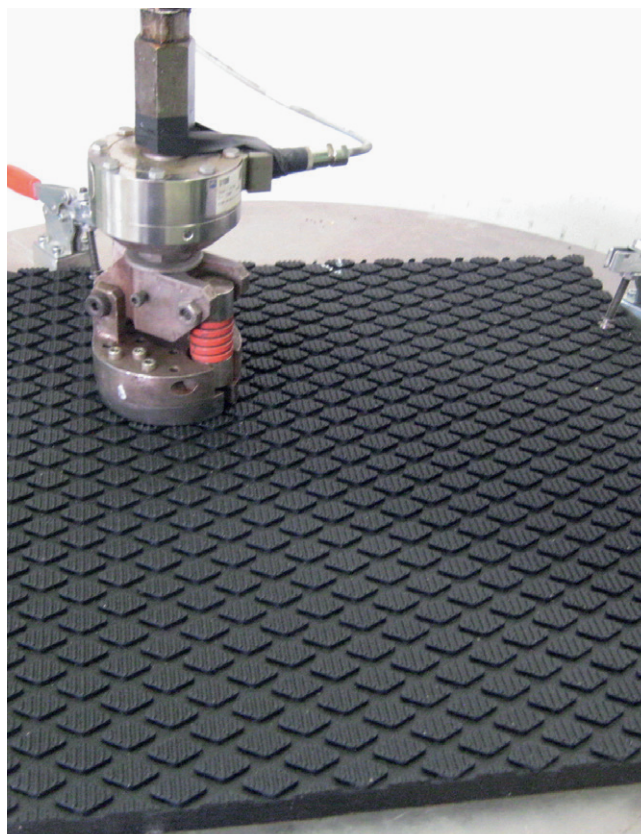


Figure 5:
Permanent tread load test

Abrasion test

The abrasion depth after 10,000 cycles amounted to 4.4 mm, this corresponds to approximately 17 % of the mat thickness. Of the ground surface 14.5 grams were rubbed off. The abrasion depth and the slight grit implicate a satisfactory wear resistance of the mat.

Slip Resistance

The slide pulling tests showed a good slip resistance on the dry or wet rubber mat surface in new condition. The measured friction coefficients (μ) surpassed the minimal value of $\mu = 0,40$ (DIN 3763) and $\mu = 0.45$ (DLG test program).



Figure 6:
Test sample after abrasion test

Cleaning distance

In test stand trials with a high pressure cleaner damage to the mat only occurred when a minimum distance of 50 cm (with a coarse dirt remover) and 25 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.

Summary

Based on test-stand investigations, the criteria tested in this DLG Approved Test evaluate the comfort and durability properties of the Animat IRON GRIP alley mat for use in the walking ways in cubicle houses. The tested Animat IRON GRIP alley mat met the requirements of the Testing Framework with respect to the investigated criteria.

The tested Alley Mat IRON GRIP met the requirements of DIN 3763 and the DLG Testing Framework with respect to the investigated criteria.

Further information

Testing agency

DLG TestService GmbH,
Gross-Umstadt location

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

DLG test framework

DLG Testing Frameworks 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

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Internal test code DLG: 2503-0086

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