

# DLG Test Report 7430

Animat Inc.

## Interlock Flooring System – walking way cover

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



**ANIMAT WALKING WAY COVER  
INTERLOCK FLOORING SYSTEM**

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

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## 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, Acid 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 acid 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.



### ANIMAT WALKING WAY COVER INTERLOCK FLOORING SYSTEM

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

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## The product

### Manufacturer and Applicant

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Product:  
Walking way cover Interlock

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www.animat.com

### Description and Technical Data

The Animat walking way cover Interlock tested here, is an elastic floor for walking ways in cubicle houses.

Black, profiled rubber mat

- thickness: approx. 20 mm
- surface with a hammer stroke structure
- underside with grooves
  - height approx. 1 mm
  - width approx. 4 mm
- space between the grooves: approx. 4 mm
- Shore A hardness: 70
- laid as single mat







































































## Assessment in brief

The Animat walking way cover Interlock 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, the acid resistance 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.

Deformation and Elasticity corresponds to class 1 DIN 3763 for single pens for calves.

*Table 1:*  
*Overview of results*

DLG QUALITY PROFILE	Evaluation
Lying measurement deformability and elasticity in new condition	     *
Lying measurement deformability and elasticity following endurance test	     *
Walking measurement deformability and elasticity in new condition	     *
Walking measurement deformability and elasticity following endurance test	     *
Lasting deformation following 250.000 endurance test	     *
Surface no appreciable wear following 250.000 endurance test	     *
Grooves on the bottom little wear	     *
Slip resistance	  **
Resistance to feed acid mixture	   ***
Resistance to uric acid	   ***
Resistance to sulfurous acid	   ***
Resistance to ammonia	   ***
Resistance to barn disinfectants	   ***
Resistance to peracetic acid	   ***
Abrasion/Wear resistance	     *
Cleaning distance with flat jet nozzle	     *
Cleaning distance with a coarse dirt remover	     *

Der DLG-Prüfrahmen gibt folgende Bewertungsmöglichkeiten vor:

\*    oder besser = erfüllt, übertrifft oder übertrifft deutlich den festgelegten DLG-Standard,  
 = genügt den gesetzlichen Anforderungen für die Marktfähigkeit,  = nicht bestanden

\*\* Einzelkriterium Rutschfestigkeit:   = bestanden,  = nicht bestanden

\*\*\* Einzelkriterium Säurebeständigkeit:    = beständig,  = bedingt beständig,  = nicht beständig

## The method

### Deformability and elasticity

#### *Lying measurement*

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).

#### *Walking measurement*

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 cm<sup>2</sup>; 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/cm<sup>2</sup> 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 cm<sup>2</sup>.

### 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 cm<sup>2</sup>, 3 mm wide ring at the periphery of the ground) was pulled with a velocity of 20 mm/s across the mat.

### Acid resistance

A permanent dipping test in accordance to DIN 3763:2022-08 was carried out. Test samples (size 30 mm x 30 mm) were completely dipped into different test liquids for 24 hours and 28 days (room temperature 20 °Celsius).

In the 28 days test the liquids were changed weekly. After the 28 days the samples were washed with distillate water and dried for 24 hours. Before and after the dipping the weight, the dimensions and the shore hardness (shore A) of the test samples were measured.

Additional visual evaluation was done for alterations like colour changing, swelling, destruction or crystallisation. All samples were evaluated in comparison to the standard water.

### 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.

## Detailed account of the test results

### Deformability and elasticity

#### Lying measurement

In the ball penetration tests in new condition with a calotte ( $r = 120$  mm), penetration depth was 3.1 mm. The resulting calculated bearing pressure of 85.6 N/cm<sup>2</sup> indicates a 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 cm<sup>2</sup>) with 250,000 alternating loads at 5,000 N.

Following the endurance test, the penetration depth of the calotte decreased from 3.1 mm to 3.0 mm. The bearing pressure increased from 85.6 N/cm<sup>2</sup> to 88.4 N/cm<sup>2</sup> (see Fig. 2a). This means that deformability and elasticity slightly decrease.

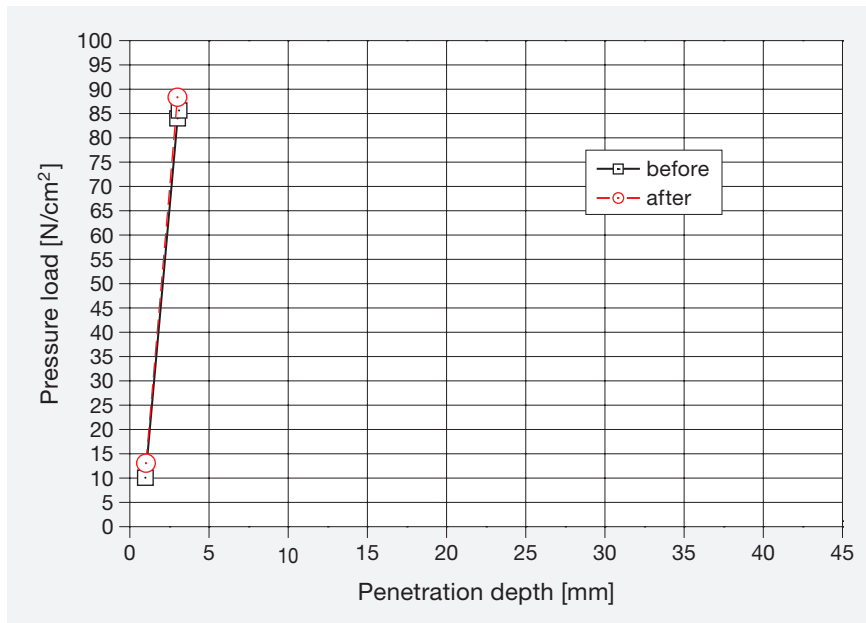


Figure 2a:  
Lying measurement –  
deformability as function of bearing pressure

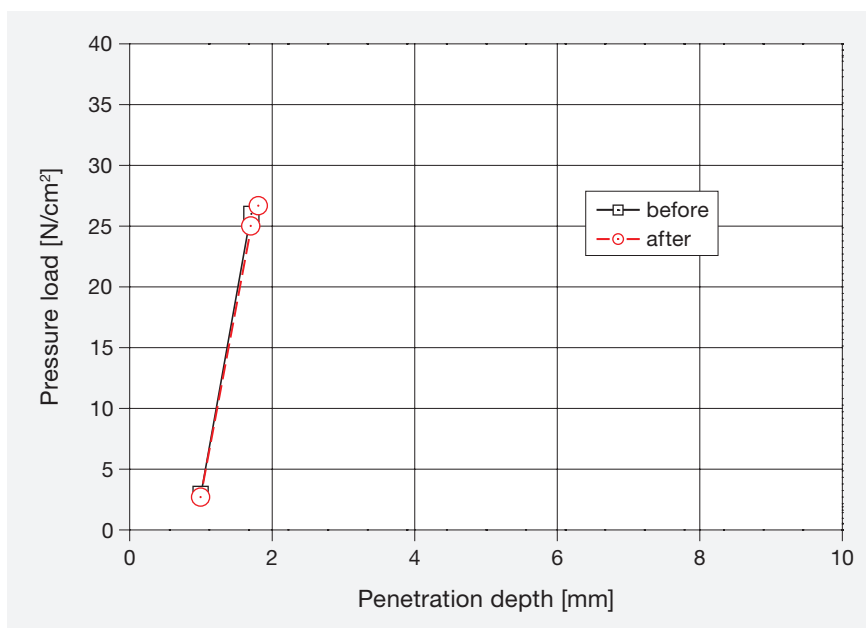


Figure 3b:  
Walking measurement –  
deformability as function of bearing pressure

#### Walking measurement

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 cm<sup>2</sup>, 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), penetration depth was 1.7 mm. This results in a calculated surface pressure of 26.67 N/cm<sup>2</sup>.

Elasticity was measured after the 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 increased to 1.8 mm (see Fig. 2b).

#### Permanent tread load

After the 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 appreciable wear on the surface and little wear on the grooves.

Lasting deformation could not be observed.



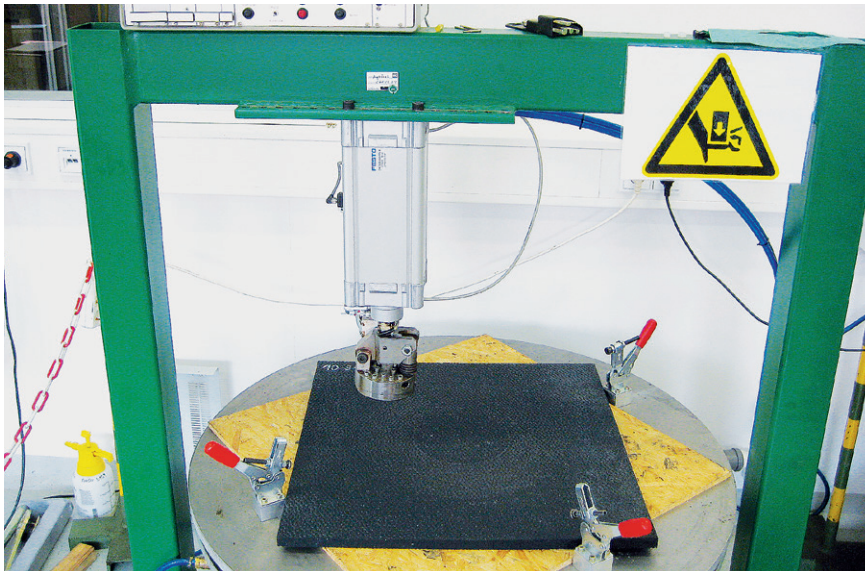


Figure 3:  
Permanent tread load test

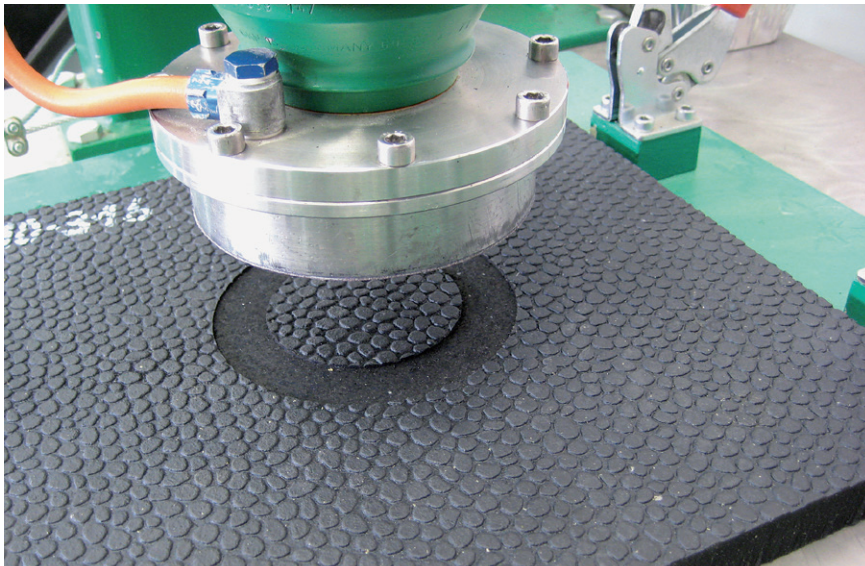


Figure 4:  
Test sample after abrasion test

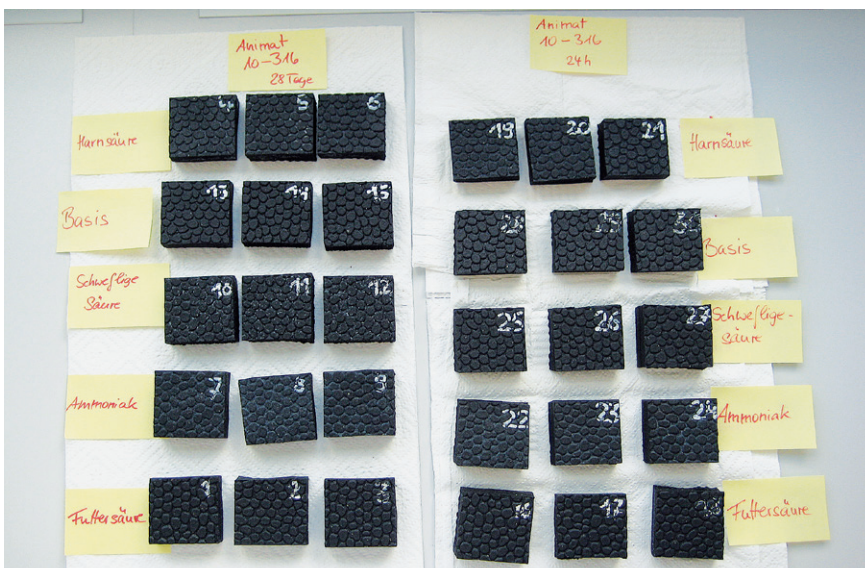


Figure 5:  
Test samples after acid test

### Abrasion test

The abrasion depth after 10,000 cycles amounted to 2.0 mm, this corresponds to approximately 10% of the mat thickness. Of the ground surface 10.4 grams were rubbed off.

### 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 ( $\mu$ ) surpassed the minimal value of  $\mu = 0,40$  (DIN 3763) and  $\mu = 0.45$  (DLG test program).

### Acid resistance

Because of the resistance against the used feed- and excrement acids and the used disinfection liquid the rubber mat seems to be well suited for the described use. The rubber mat was resistant against the used test liquids. The rubber mat shows no appreciable changing.

### 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 5 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.

Table 2:  
Test liquids and results – acid resistance

Test liquid	Concentration	Result after 24 hours residence time	Result after 28 days residence time	Evaluation
<b>Feed acid mixture</b>				
	concentrate, pH 2	no changing	no changing	resistant
<b>Excrement acids</b>				
Uric acid	saturated urea solution (0,4 %)	no changing	no changing	limited resistant
Sulfurous acid	5-6% SO <sub>2</sub>	no changing	little colour changing (light colored spots on the surface)	resistant
Ammonia solution	32% solution	no changing	no changing	resistant
<b>Disinfection liquid</b>				
Barn disinfection liquid	2%-solution of a product with formic acid and glyoxyl acid	no changing	no changing	resistant
Peracetic acid	3000 ppm	no changing	no changing	resistant

## Summary

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

The tested Interlock Flooring System 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, Germany

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

### Division head

Dr. Michael Eise

### Test engineer(s)

Dr. Harald Reubold\*

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\* 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.

The Interlock Flooring System – walking way cover has already received the DLG-approved test mark in 2016. The information presented in the report Results are based on the DLG test report no. 6355. According to the manufacturer, the walking way cover manufactured unchanged in the tested version.

Internal test code DLG: 2302-0037

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