

# DLG Test Report 6883

Industrias del Caucho

## Cover mat for lyingbox mattresses Family Code: 1316

Abrasion, Slip resistance,  
Acid resistance, Cleaning distance



INDUSTRIAS DEL CAUCHO  
FAMILY CODE: 1316

- ✓ Abrasion
- ✓ Slip resistance
- ✓ Acid resistance
- ✓ Cleaning distance

DLG Test Report 6863

## 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 “Abrasion, Slip resistance, Acid resistance, Cleaning distance” includes technical measurements on test benches of the DLG Test Center. The abrasion resistance, the acid resistance, the slip resistance and the cleaning distance were measured and a permanent tread load was applied. The test was based on the DLG Testing Framework for elastic flooring, as of April 2010.

Other criteria were not investigated.

## Assessment – Brief Summary

The cover mat for lyingbox mattresses Family Code: 1316 tested here was investigated with regard to durability properties on test stands in the DLG-APPROVED test for single value-determining criteria. The abrasion resistance, the slip resistance, the acid resistance and the cleaning distance were measured.

Table 1:  
Overview of results

Test characteristic	Test result	Evaluation*
<b>Abrasion test</b>		
	good	+
<b>Slip resistance **</b>		
	good slip resistance on dry and wet mat surface	+
<b>Cleaning distance</b>		
with flat jet nozzle	20 cm	○
mit Dreckfräser	40 cm	○
<b>Acid resistance ***</b>		
Feed acid mixture	resistant	+
Uric acid	resistant	+
Sulfurous acid	resistant	+
Ammonia solution	resistant	+
Disinfection liquid	resistant	+
Peracetic acid	resistant	+

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

\*\* Evaluation range: + / -

\*\*\* Evaluation range: + = resistant / ○ = limited resistant / - = not resistant

## The Product

### Manufacturer and Applicant

Industrias del Caucho,  
Ctra. Artica 16, E-31013 Artica

Product:  
Cover mat Family Code: 1316

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### Description and Technical Data

The cover mat tested here, is a cover mat for cow mattresses in the resting area in cubicle houses.

- Black, cover mat for lying box mattresses
- ca. 3 mm thick
  - black surface with silk screen structure
  - red underside with textile structure
  - seamless installation
  - Shore A: ca. 75

## The Method

### 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/cm<sup>2</sup> 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 cm<sup>2</sup>.

### 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 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 EN ISO 175:2000 (performance of synthetic material against liquid chemicals) 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 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

### Abrasion test

The abrasion depth after 10,000 cycles amounted to 0.2 mm, this corresponds to approximately 6 % of the mat thickness. From the ground surface 0.2 grams were rubbed off. The abrasion depth and the slight grit implicate a good wear resistance of the cover mat.

### 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 ( $\mu$ ) all surpassed the minimal value of  $\mu = 0.45$  which speaks for a good foothold.

### Cleaning distance

In test bench trials with a high pressure cleaner damage to the mat only occurred when a minimum distance of 40 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.

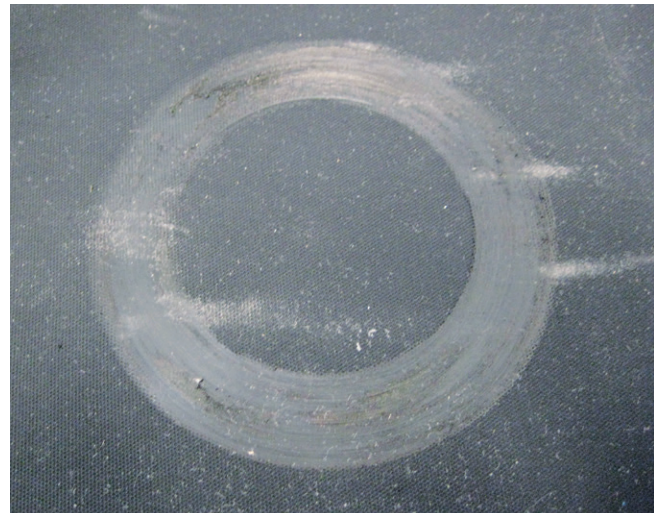


Figure 2:  
Test sample after abrasion test

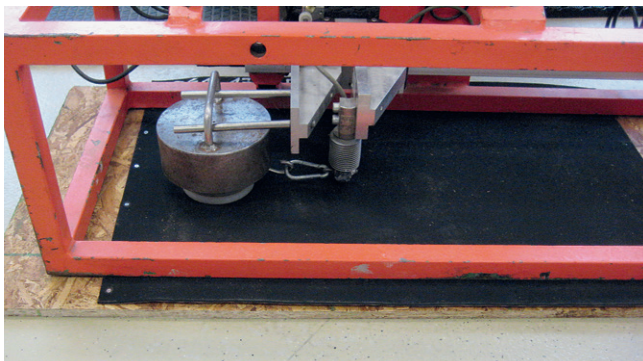


Figure 3:  
Slip resistance measurement



Figure 4:  
Cleaning distance measurement

## Acid resistance

The cover mat was resistant against the used test liquids.

The differences in weight, thickness and Shore A hardness between the acid treated and not acid treated samples were minor and lay in the range of water as standard.

Against the used liquids the cover mat seems to be good suited for the described use.

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	resistant
Sulfurous acid	5-6 % SO <sub>2</sub>	no changing	no changing	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



Figure 5:

Samples after acid resistance test

## Summary

Based on test-stand investigations, the criteria tested in this DLG-APPROVED test for single value-determining criteria evaluate the durability properties of the cover mat for lyingbox mattresses Family Code: 1316.

The tested cover mat for lyingbox mattresses Family Code: 1316 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](http://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](http://www.dlg.org/merkblaetter.html).

### Test performed by

DLG e.V.  
Test Center Technology and Farm Inputs  
Max-Eyth-Weg 1,  
64823 Groß-Umstadt  
Germany

### DLG test scope

DLG-APPROVED test for single value-determining criteria "Elastic Stable Flooring" (as at 04/2010)

### 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 bene-

fits, and contribute to the expert knowledge base of the agricultural industry. Further information can be obtained under [www.dlg.org/mitgliedschaft](http://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.

Internal test code DLG: 17-853

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