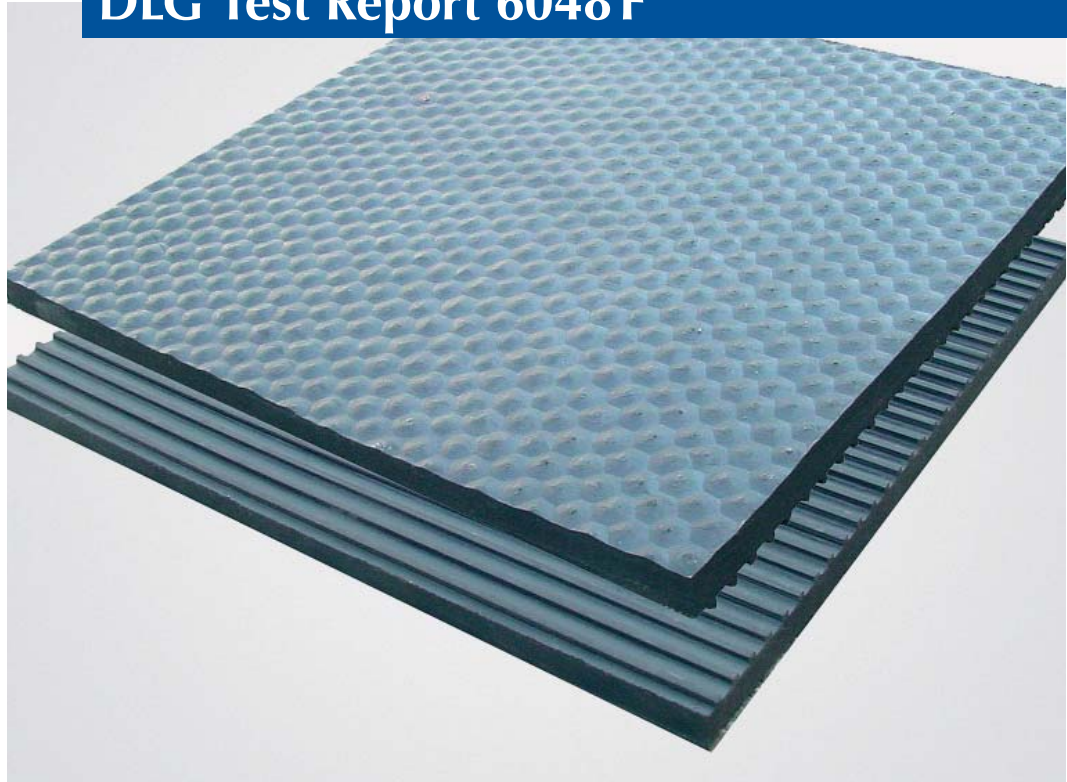


Ferox Trade

Walking way cover Microrib

Deformability/Elasticity, Permanent tread load,
Abrasion, Slip resistance, Acid resistance

DLG Test Report 6048 F



Registering company
Ferox Trade
Merwedestraat 56 A
NL-5347 KW Oss
Telephone: 0031 412 404511
Telefax: 0031 412 645556
bart.megens@ferox-rubber.com

Description

Elastic floor cover for level concrete walking ways in cattle housing

- Black, profiled rubber mat, ca. 18 mm tick
- surface with a hammerstroke structure
- under side with grooves
- height ca. 2.5 mm, width ca. 3.5 mm
- Strip wise installation
- Shore A: ca. 60
- Available sizes: length: any length, width: up to 3 m.



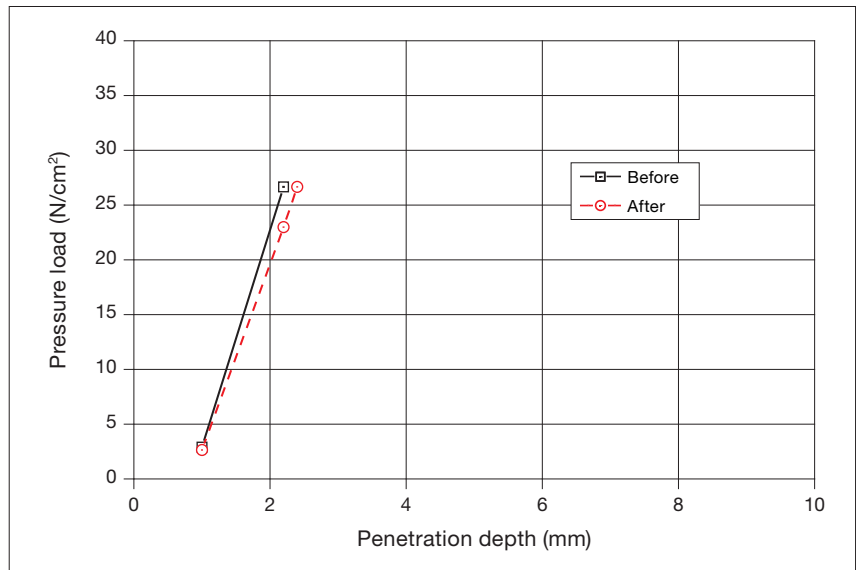
DLG e.V.
Test Center
Technology and Farm Inputs

Test results and detailed evaluations

Deformability and elasticity

In indentation 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 2.2 mm. This results in a calculated surface pressure of 26.7 N/cm².

Elasticity was measured after the rubber 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 2.4 mm.



Picture 2: Deformability as a function of surface pressure

Evaluation*	
- in new condition	+
- after the permanent pressure test	+

Permanent tread load

After the rubber mat had been exposed to a permanent tread load exerted by 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)) in test stand trials (250.000 alternating loads of 5.000 N (corresponding to ca. 500 kg), the rubber mat showed no appreciable wear.

Lasting deformation could not be observed.

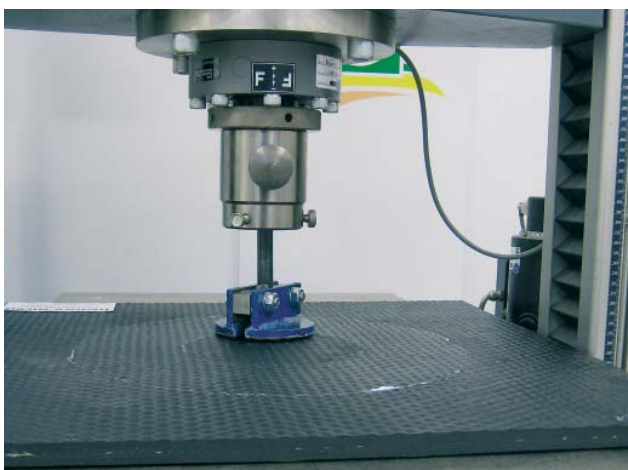
Evaluation*	
- no lasting deformation	++
- surface no appreciable wear	+
- grooves on the bottom no appreciable wear	+

Abrasion test

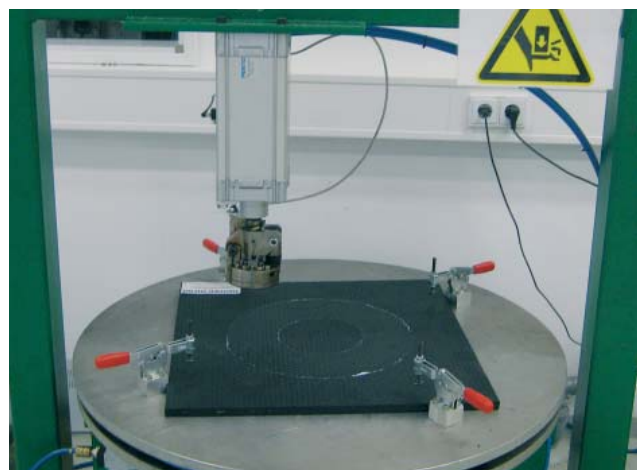
In a standardised abrasion test during which the surface was grinded with an emery cloth (granulation 280) and a grinding pressure of 500 N (= 8.1 N/cm² surface pressure), the abrasion depth after 10,000 double strokes amounted to 1.7 mm, this corresponds to approximately 9% of the rubber thickness. Of the ground surface (61.5 cm²) 10.6 grams were rubbed off.

Evaluation*	
The minor abrasion depth and the slight grit implicate a good wear resistance of the rubber mat	+

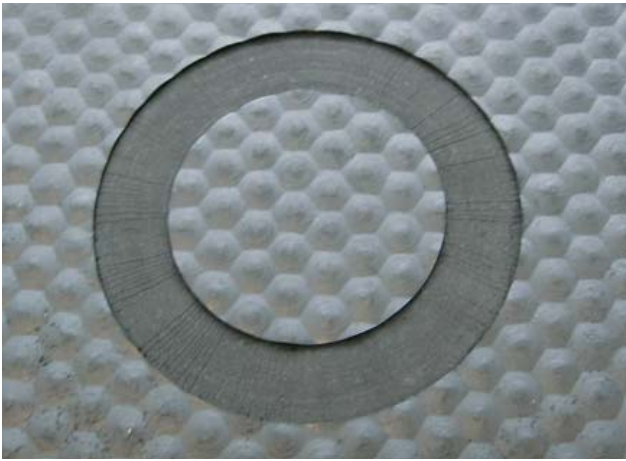
* Evaluation range: ++/+/o/-/-- (o = standard)



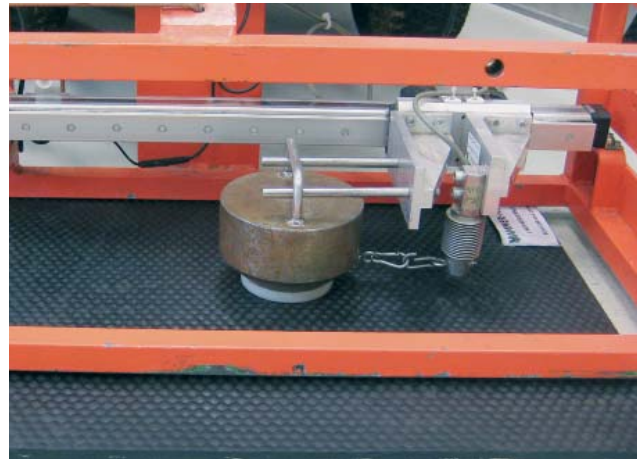
Picture 3: Deformation measurement



Picture 4: permanent tread load test rig



Picture 5:
Test sample after the abrasion test



Picture 6:
Slip resistance measurement

Slip resistance

Slide pulling tests using a round plastic foot (with a contact area of 75 cm²) and with a velocity of 20 mm/s showed a good slip resistance on the dry or wet rubber surface in new condition. The measured friction coefficients (μ) all surpassed the minimal value of $\mu = 0.45$ which speaks for a good foothold.

Evaluation*
Good slip resistance on dry and wet rubber mat surface +

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 x 30 mm) were complete dipped in different test liquids for 24 hours and 28 days (room temperature 20° Celsius). In the 28 days test the liquids were changed weekly.

Before and after the dipping the weight, the dimensions and the shore hardness (shore A) of the test samples was measured. Additional a visual evaluation was done for alterations like colour changing, swelling or destruction.

Evaluation**
The walking way cover was resistant against uric acid and the disinfection liquid and limited resistant against the other used test liquids.
The walking way cover seems to be satisfactory suited for the described use.

Acid resistance against barn relevant acids

- | | | |
|-----------------------|------------------------------|---|
| - feed acids | noticeable material changing | ○ |
| - excrement acids | noticeable material changing | ○ |
| - disinfection liquid | noticeable material changing | ○ |

** Evaluation range: + = resistant; ○ = limited resistant; - = not resistant



Picture 7:
Test samples after acid test

table 1:
test liquids and results acid resistance

concentration	result after 24 hours residence time	result after 28 days residence time	Evaluation	Bewertung
Feed acid mixture				
	concentrate, pH 2	surface little matt	surface matt with bright points	limited resistant
Excrement acids				
– Uric acid	saturated urea solution (0,4%)	no changing	no changing	resistant
– Sulfurous acid	5-6% SO ₂	surface little matt	bright coat on the surface	limited resistant
– Ammonia solution	32% solution	no changing	bright coat on the surface	limited resistant
Disinfection liquid				
– Disinfection liquid	2%-solution of a product with formic acid and glyoxyl acid	no changing	no changing	resistant
– peroxyacetic	3000 ppm	no changing	bright coat on the surface	limited resistant

Test

The DLG FokusTest included technical measurements on test rigs and in the chemical lab of the DLG test station. Deformability and elasticity were examined and a permanent tread load test was carried out. Examinations of abrasion resistance in an abrasion test using an emery cloth, examinations of slip resistance with the aid of slide pulling tests and an acid resistance test were carried out.

The mat fulfills in the tested criteria the requirements for the DLG FokusTest sign.

Other criteria were not tested.

Realization of the tests

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

Reporting engineer

Dr. Harald Reubold

Project manager farm inputs and technique animals

Dr. Michael Eise



ENTAM – European Network for Testing of Agricultural Machines, was created from the merger of European testing sites. ENTAM's objective is the Europe-wide distribution of test results for farmers, agricultural equipment dealers, and producers.

More information about the Network is available at www.entam.com or by writing. E-mail Address: info@entam.com

11-311
December 2011
© DLG



DLG e.V. – Test Center Technology and Farm Inputs

Max-Eyth-Weg 1, D-64823 Groß-Umstadt,
Telephone 069 247 88-600, Fax: 069 247 88-690, E-mail: Tech@DLG.org,
Internet: www.DLG.org

Download of all DLG test reports at: www.DLG.org/testsagriculture.html!