

DLG e.V.  
DLG Test Centre for Agricultural Machinery and Farm Inputs  
Max-Eyth-Weg 1  
64823 Groß-Umstadt

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## ***DLG Fokus Test***

***Geyer & Hosaja cow mat for cubicles Leg Mat, Test-Nr.: 11-100***



### ***Registering and manufacturing company***

Geyer & Hosaja Sp. z.o.o.

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### ***Description***

Black rubber mat for the resting area of high cubicles in cattle housing, thickness approximately 30 mm. Upper side with hammerstroke structure, underside with **balks and knops**. **Balks** ca. 9 mm high, width ca. 14 mm, length ca. 43,5 mm; **knops** ca. 4,5 mm high, diameter ca. 17,5 mm .

Shore A hardness: 70.

Available sizes: Length 170 cm, 175 cm und 180 cm. Width: 110 cm, 115 cm und 120 cm.

Installation as a single mat.

## Test results and detailed evaluations

### Deformability and elasticity

In ball penetration tests in new condition with a spherical cap ( $r=120$  mm) and a penetration force of 2.000 N (corresponding to ca. 200 kg), penetration depth was 9.4 mm. The calculated bearing pressure of 28.2 N/cm<sup>2</sup> indicates a relatively small load on the carpal joints during lying down and getting up.

Elasticity was measured after the cow mat had been exposed to a continuous tread load exerted by the steel foot (contact area 75 cm<sup>2</sup>) and 100.000 alternating loads of 10.000 N. After the endurance test, the penetration depth of the spherical cap increased from 9.4 mm to 9.7 mm. The calculated bearing pressure reduced from 28.2 N/cm<sup>2</sup> to 27.4 N/cm<sup>2</sup>. This means that deformability and elasticity increases slightly.

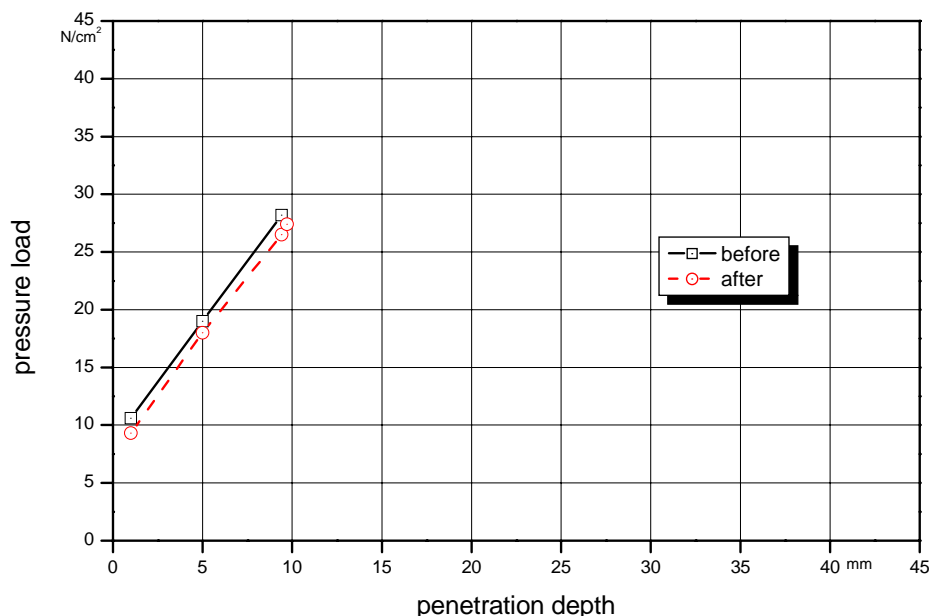
Evaluation: Deformability and elasticity:

In new condition (+)

After continuous tread load (+)

#### ***2011-100 Geyer Hosaja Leg Mat***

Deformability: penetration depth of the spherical cap ( $r=120$ mm) as a function of the bearing pressure before and after the permanent tread load

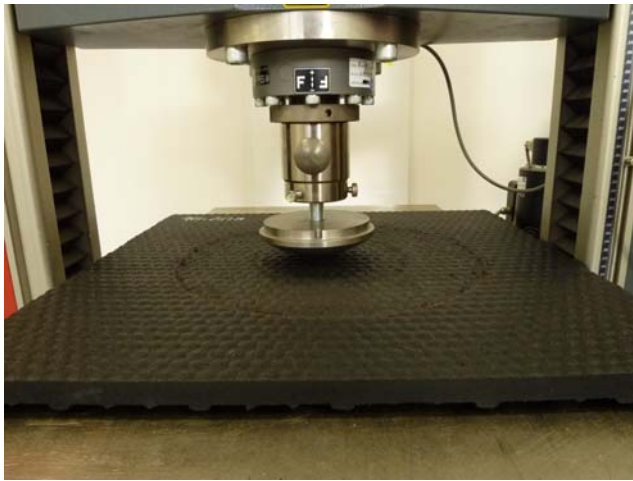


Picture 2: Deformability as a function of surface pressure (Neue Grafik)

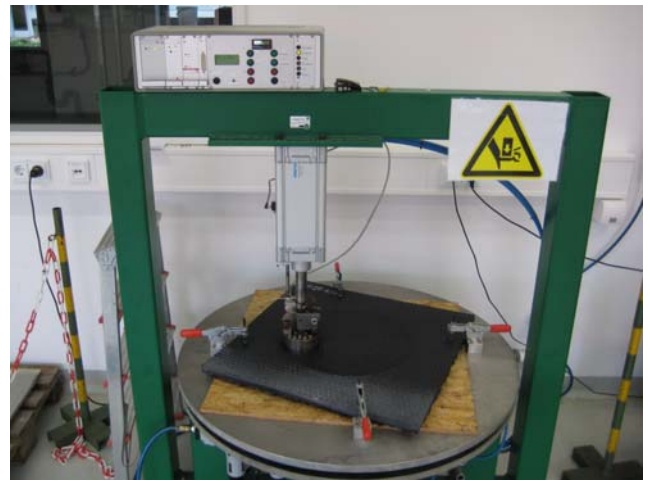
### ***Permanent tread load***

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 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)) in test stand trials (100.000 alternating loads of 10.000 N (corresponding to ca. 1000 kg), the rubber mat showed **no appreciable wear on the surface and little wear on the balks on the bottom**. Lasting deformation could not be observed.

Evaluation: **no appreciable wear on the surface (+)**  
**little wear on the balks on the bottom (o)**  
no lasting deformation (++)



Picture 3: Deformation measurement

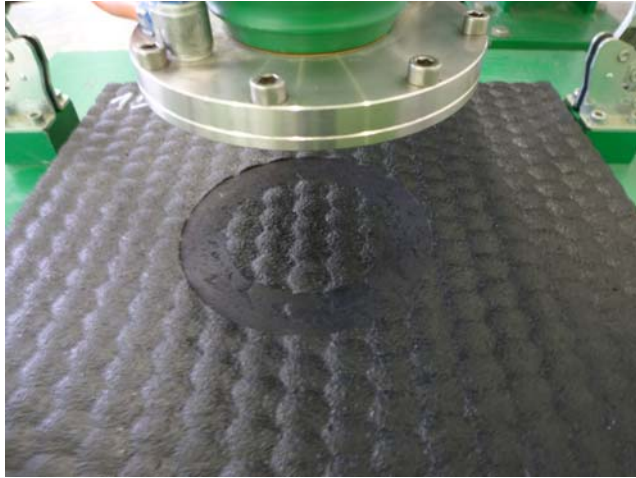


Picture 4: Permanent tread load test rig (Neues Foto)

### ***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/cm<sup>2</sup> surface pressure), the abrasion depth after 10,000 cycles amounted to 1.6 mm, this corresponds to approximately 5 % of the rubber thickness. Of the ground surface (61.5 cm<sup>2</sup>) 3.2 grams were rubbed off.

Evaluation: The minor abrasion depth and the slight grit implicate a good wear resistance of the rubber mat (+).



Picture 4: Test sample after the abrasion test

### ***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. The slide pulling tests showed a good slip resistance on the dry or wet rubber surface in new condition. The measured friction coefficients ( $\mu$ ) 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 (+).



Picture 5: Slip resistance measurement

## ***Test***

The DLG FokusTest included technical measurements on test rigs 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 were carried out.

Other criteria were not tested.

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