

FEROX Trade Cow Mattress Roll

DLG Test Report 6073



Registering company
FEROX Trade
Merwedestraat 56 A
NL 5347 KW Oss
Telephone: 0031 412 404511
Telefax: 0031 412 64 55 56
info@ferox-rubber.com
www.ferox-rubber.com

Short description

Floor cover

- with a black rubber mat with textile inlay as top cover,
- Thickness ca. 11 mm,
- Shore A hardness: ca. 68,
- Top cover rubber mat with a hammer beat structure.

Underlay

- Poly-Urethan foam plates, Thickness ca. 28 mm,
- Seamless installation.

(Technical data see page 6.)



DLG e.V.
Testzentrum
Technik und Betriebsmittel

Test results

Test criteria	Test result	Evaluation ¹
Suitability		
Suitable as an elastic floor cover in resting area of high cubicles in cubicle houses. Small additional quantities of litter are highly recommended.		
Technical criteria		
Wear resistance, Durability and ageing (Test stand trials)		
– Abrasion test	good wear resistance	+
– permanent tread load test	no significant, lasting deformation	++
	no significant wear	+
	no damage on the top cover and the foam	+
	noticeable material changing, limited resistant	○ ²
– Acid test		
Dimensional stability		
	no significant alteration in length or width	+
Deformations	noticeable deformation was not observed	+
Handling, installation		
Installation by the owner	maintainable work, weight of the rubber mat roll	○
Installation instructions	detailed and understandable	+
Maintenance	not necessary	○
Cleaning and disinfection		
Self cleaning	good	+
Daily cleaning	does not cause any difficulties	+
Efficient thorough cleaning and disinfection	good possible	+
Warranty		
Rubber mat	5 Years	
Foam	5 Years	
Recycling		
Rubber mat	no recycling	--
Foam	recycling concept	+
Animal related criteria		
Behavioral observations		
No deviation from specific behaviour noticeable		+
Joint evaluation		
	87.8 % without any pathological result	+
Slip resistance		
	during on dry and wet cover slides tests good	+
Secure foothold of the animals	good on farms	+
Deformability and elasticity		
In new condition	20.0 mm, very good	++
After a permanent tread load	20.8 mm, very good	++
Toxicological safety		
confirmed by the manufacturer		○

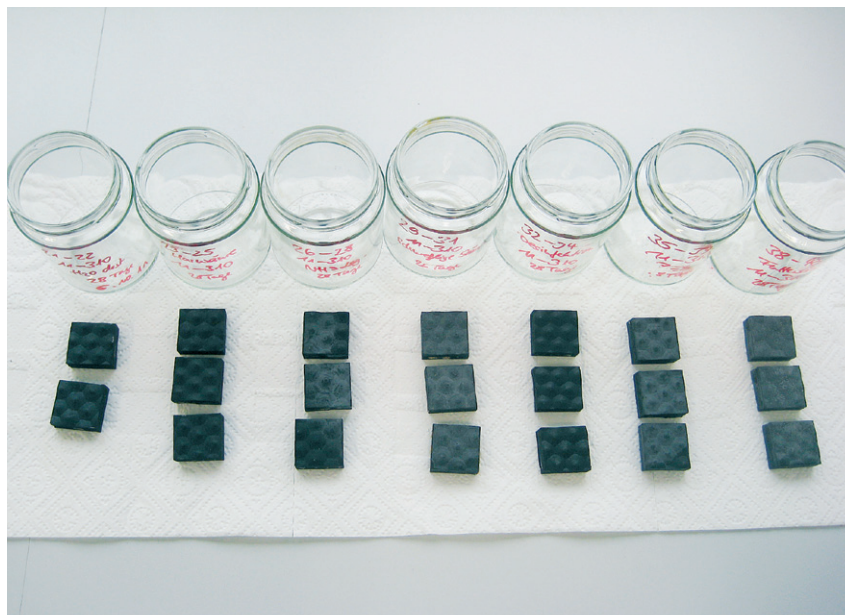
[1] Evaluation range: ++ / + / ○ / – / -- (○ = standard)

[2] Evaluation range: + / ○ / – (+ = resistant, ○ = limited resistant, – = not resistant)

I. SUITABILITY

The FEROX Cow Mattress Roll is suitable as an elastic floor cover in resting area of high cubicles in cubicle houses. Because of the seamless installation, the installation is only possible with self-supporting cubicle dividers. Problem free installation requires proper construction of the concrete foundation with an overall inclination of at least 3 %, better 4 %.

For easing the cleanliness and for humidity adsorption small additional quantities of litter are highly recommended.



Picture 2:
Test samples after acid test

II. TECHNICAL CRITERIA

Wear resistance, durability and ageing

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 2.5 mm, this corresponds to approximately 20 % of the mat thickness. Of the ground surface (61.5 cm²) 12.0 grams were rubbed off. The small abrasion depth and the little abrasion implicate a good wear resistance of the cow mattress.

After exposure to a permanent tread load exerted by a round steel

foot (contact area 75 cm²) on a test stand and 100.000 alternating loads of 10.000 N (corresponding to ca. 1000 kg), no noticeable wear on the top cover and the foam was determined. No lasting deformation could be observed.

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° Cel-

sus). 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.

The top cover of the cow mat was resistant against uric acid, ammonia solution and disinfection liquid. Limited resistant against the other used test liquids. The top cover of the cow mat seems to be satisfactory suited for the described use.

Table 1:
Test liquids and results acid resistance

Test liquid	concentration	result after 24 hours residence time	result after 28 days residence time	Evaluation
Feed acid mixture	concentrate, pH 2	no changing	surface matt finished	limited resistant
Excrement acids				
– Uric acid	saturated urea solution (0.4 %)	no changing	no changing	resistant
– Sulfurous acid	5-6 % SO ₂	surface matt finished	surface light coloured	limited resistant
– Ammonia solution	32 % solution	no changing	no changing	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	surface light coloured	limited resistant

Dimensional stability

During the test period of 8 month, a noticeable alteration of length and width did not occur in practice after proper installation. Deformation (formation of craters and channels) was not observed.

Handling, installation

The installation instructions are detailed and understandable. The installation is possible with maintainable work of the farmer. Installation requires two persons. In lyingboxrows with more than 25 cubicles the top cover has to be moved with suitable lifting equipment. The top cover rubber mat will be installed in the front and on either side with stainless steel bands. For functional capability no maintenance is necessary.

Cleaning and disinfection

The self cleaning effect is good and the daily cleaning of the surface does not cause any difficulties. Small quantities of litter make it easier to clean the cubicles as well as the animals and to keep them dry. The impermeable surface allows for easy, efficient disinfection and thorough cleaning (e.g. using a high-pressure cleaner).

It is recommended to soak the dirt before cleaning. Under the floor cover and in the foam moisture may collect. This can not be avoided. Complete cleaning is only with extensive work possible because the floor cover is fixed all around. For cleaning and disinfection of the floor, only the cleaning agents permitted by the manufacturer should be used.

Warranty and recycling

According to its warranty conditions, the registering company grants a warranty of 5 years for the rubber mat and the foam.

The registering company has no recyclingconcept for the rubber mat. The manufacturer takes the foam back in clean condition. A written agreement with the manufacturer is recommended.

III. ANIMAL RELATED CRITERIA

Behavioural observations

During 8 month of practical use, behavioural observations in the form of video- and direct observations were carried out. The direct observation of 20 getting-up processes each on two farms did not show any deviation from the normal movement process. In addition, no deviations from specific behavioural patterns (e.g. typical movement process getting up and lying down, lying positions) which would have to be attributed to the floor cover were determined.

Joint evaluation

On three farms which had installed only the tested cow mattress, a total of 101 cows were examined for externally visible damage in the joint area as of the second third of lactation (joint evaluation). Evaluation comprised the left and right half of the body and focused on

the 10 spots exposed during resting (cf. figure 3). Joint evaluation was always carried out by the same person at the end of the winter feeding period. The results were classified according to the following scheme (table 2).

The percentage of the results found in the 101 animals examined is shown in figure 4. 87,8 % of the spots evaluated did not show any pathological result. Great alterations, like increased circumference in the bursal area, open joint participation were not found.

Small alterations, such as hairless spots were found at 8,8% of the spots evaluated. At 3.4 % of the spots evaluated medium alterations, such as skin abrasions and increased circumference in the bursal area (covered) at the joints were found. The pathological results determined were mainly found in the tarsal joint. Only in a few cases were pathological results found in the ankles ort the carpal joint.

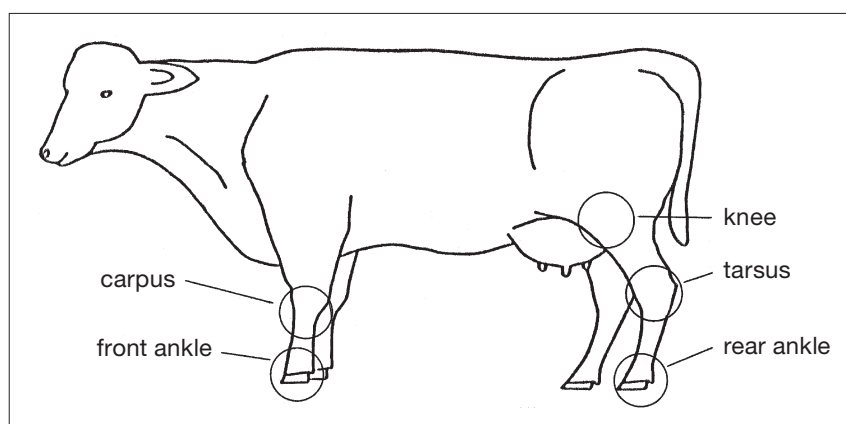


Figure 3:
The areas shown were examined

Table 2:
Classification of the joint evaluation

Result	Classification
without any particular result	no alterations
hairless spots < 2 cm	small alterations
hairless spots > 2 cm	small alterations
skin abrasions < 2 cm	medium alterations
skin abrasions > 2 cm	medium alterations
increased circumference in the bursal area, covered	medium alterations
increased circumference in the bursal area, open	great alterations
joint participation	great alterations

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 unlittered cover. The measured friction coefficients (μ) all surpassed the minimal value of $\mu = 0.45$.

On two farms, 20 getting-up processes each were examined using direct observation. These observations also showed that the animals had a good foothold. Slipping of the animals was not observed. Litter improves the foothold.

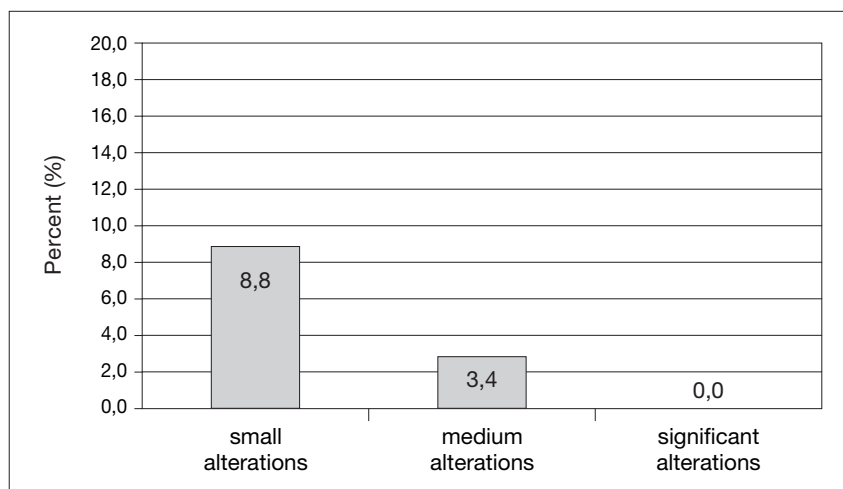


Figure 4:
percentage of the results found

Deformability and elasticity

In ball impression tests in new condition with a calotte ($r = 120$ mm) and at a penetration force of 2.000 N (corresponding to ca. 200 kg), penetration depth was 20.0 mm. The calculated bearing pressure of 13.3 N/cm² indicates a relatively small load on the carpal joints when lying down and getting up.

Elasticity was measured after a permanent tread load exerted by the steel foot (100.000 alternating loads of 10.000 N). After the endurance test, the penetration depth increased from 20.0 to 20.8 mm. The bearing pressure reduced from 13.3 N/cm² to 12.8 N/cm² (figure 5). This means that deformability and elasticity increased little.

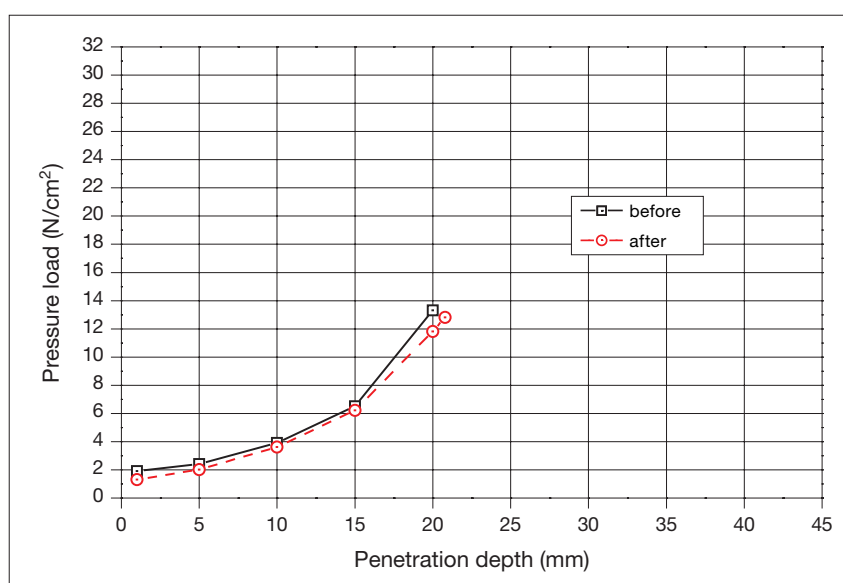


Figure 5:
Deformability of the calotte ($r = 120$ mm) as a function of surface pressure

Toxicological safety

The manufacturer confirmed the toxicological safety of the cow mattress.

IV. SURVEY RESULT

A survey among 7 farms, which have been using the stall floor up to three years, confirmed the experiences of the test.

On the farms, a total of 567 cubicles were equipped with the floor cover. On 4 farms the cow mattress was installed by the farmer. Two

of these farmers stated that installation was easy and did not require any practice. The other two farms want to have instructions from the distributor.

On 86 % of the farms the cubicles were accepted well by the animals. Only on one farm the animals had acclimatization problems. 43 % of the farmers did not notice slipping of the animals. On 57 % of the farms slipping of the animals was observed. All of the farmers observed a reduction of small joint alterations. On no farm damage on the mattress was observed. The cow mattress is evaluated good or very good by 71 % of those surveyed. 86 % would purchase it again if necessary.

Description and technical data

(measured values)

Warranty

Rubber mat: 5 Years
PU foam: 5 Years

Available sizes

Rubber mat: width 185 cm,
length: customer request, max. 50 m
(ca. 982 kg)

PU foam: suitable for the available
rubber mat

Main measurement and weight

Rubber mat: Thickness (middle
and edge) ca. 12.5 mm, ca. 22 mm/
Weight per m² ca. 17.7 kg

PU foam: Thickness ca. 28 mm/
weight per m² ca. 15.6 kg

Test

The utility value test included
technical measurements on test
rigs, practical tests, behavioural
observations, joint evaluations and
a survey among farmers.

Test stand trial comprised tests
of abrasion resistance (using an
emery cloth), slip resistance
(through slide pulling tests) and
the acid resistance.

Practical application

Schäfer-Wolf GbR,
64739 Höchst

Realisation of the test

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

DLG-test commission

Dr. agr. Steffen Pache, Köllitsch

Dipl.-Ing. Andreas Pelzer,
Bad Sassendorf

Reiner Schmidt, Ronneburg

Dipl.-Ing. agr. Klaus-Werner Wolf,
Höchst

Dr. med. vet./Dipl.-Ing. agr. Univ.
Wilfried Wolter, Giessen

Reporting engineer

Dr. agr. Harald Reubold,
Groß-Umstadt

DLG-committee for animal welfare

Frau Dr. sc. agr. Christiane Müller,
Trenthorst

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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

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