DLG Test Report 6437

New Farms s.r.l.

Blister Sandbedmat

www.DLG-Test.de

Overview

A quality mark “DLG-APPROVED FULL TEST“ is awarded to agricultural products which passed DLG’s comprehensive usability test according to independent and approved evaluation criteria. The product’s most important criteria from the farmer’s point of view are evaluated during this test. The test includes investigations on test benches and under various operating conditions and furthermore, the tested item must prove itself during a practical testing on a farm. The test conditions and procedures are fixed in a test framework which is developed by an independent test commission and adjusted regularly according to accepted rules of engineering as well as to latest scientific and agricultural knowledge and requirements. The successful test concludes with the publication of a test report as well as with the award of the quality mark, being valid for five years after the award.

The DLG-APPROVED full test included technical measurements in the lab of the DLG Test Center and practical examinations, behaviour observations, joint evaluation and a survey on agricultural farms. On test rigs in the lab the deformation, the slip resisitance and the acid resistance were measured and a permanent tread load test was carried out.

The test was based on the DLG Testing Framework for elastic stable flooring, as of April 2010.

Assessment – Brief Summary

The Blister sandbedmat tested here, a system for building a resting area in cubicles in cubicle houses, was tested as a system with a rubbermat filled with sand and organic litter with regard to durability and comfort properties. On the practical farms the installation and the dimensional stability were evaluated and behaviour observations and a joint evaluation were executed. The joint evaluation was clearly better than the standard.

Table 1:
Overview of results

Test criteria	Test result	Evaluation*
Suitability	as an building block to build an elastic floor cover in the resting area in cubicle houses.	
TECHNICAL CRITERIA		
Test rig measurements		
Permanent tread load	no lasting deformation	+ +
	no noticeable wear	+
Acid resistance**		
Feed acid mixture	resistant	○
Uric acid	resistant	+
Sulfurous acid	resistant	+
Ammonia solution	resistant	+
Disinfection liquid	resistant	○
Peracetic acid	resistant	○
Dimensional stability		
	no significant alteration in length or width	+
	noticeable deformation was not observed	+
Handling, installation		
Installation by the owner	maintainable work	○
Installation instructions	detailed and understandable	+
Maintenance	continous spreading of litter necassarry	○
Self cleaning	good	+
Daily cleaning	does not cause any difficulties	+
	resting area very dry and the cows are clean	+ +
Warranty, recycling		
Sandbedmat	5 Years declining	
	recycling concept	+
ANIMAL RELATED CRITERIA		
Behavioral observations	no deviation from specific behaviour noticeable	+
	good footedness of the cows	+
Joint evaluation	94,0 % without any pathological result	+ +
Deformability and elasticity	with enough litter good deformability and elasticity	+
Toxicological safety	confirmed by the manufacturer	○

* Evaluation range: + = resistant; ○ = imited resisitant; – = not resisitant
** Evaluation range: + + / + / ○ / – / – – (○ = standard)

The Product

Manufacturer and Applicant

New Farms s.r.l., Via Visano Nr. 2, I-25010 Remedello (BS)

Product: Blister sandbedmat

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Description and Technical Data

The Blister sandbedmat tested here, is a system for building a lying area in cubicle barns for cows and cattle.

Black Rubber sandbedmat with 35 quadratic chambers ca. 20 cm x 20 cm, which are filled with sand. The surface of the sandbedmat should be interspersed with ca. 5 cm straw litter.

The sanbedmat are fixed with 13 screws plus disks and dowel on the anchoring supports on the floor.

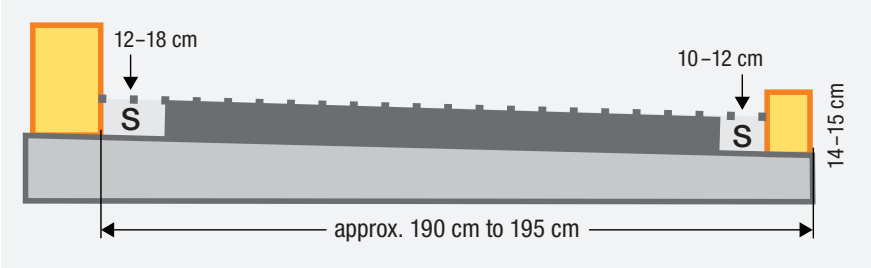

Figure 2:
Drawing of the sandbedmat

Table 2:
Technical Data

Length	154 cm
width	114 cm
high	11 cm
Weight	50 kg each mat
Shore A	75

Figure 3:
Blister Sandbedmat with sand

Figure 4:
Blister Sandbedmat (litter removed to see the mat) and straw litter

The Method

Suitability

The suitability and the range of use of the system for building a lying area in cubicle barns were evaluated by a practice-oriented focus.

Survey

A survey, by asking owners which had the equal system for building a lying area in cubicle barns for min. 3 month, was carried out to verify the test results.

TECHNICAL CRITERIA

Wear resistance, durability and ageing

Permanent tread load

The permanent tread load is measured on a test stand with a round steel foot in the standard test programme with 100,000 alternating loads at 10,000 N (corresponding to approx. 1,000 kg). 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 cm²; 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.

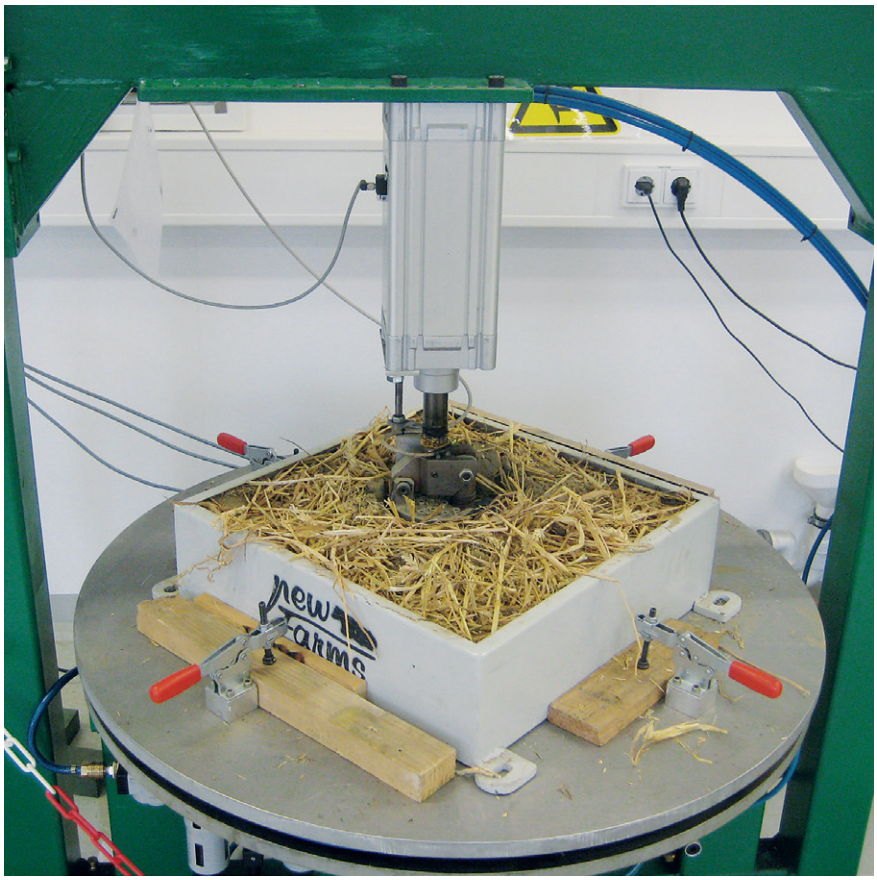

Figure 5:
Permanent tread load test

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 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.

Dimensional stability

The dimensional stability (formation of hollows) of the system was evaluated after instalation in accordance to the installation instructions from the manufacturer.

Additional was evaluated if alteration in length or width or deformation of the sandbedmat was noticeable.

Handling, installation and maintenance

The handling, installation and necassary maintenance of the sandbedmat were evaluated related to practice.

Cleaning

The cleaning of the sandbedmat was evaluated related to practice.

Guarantee and recycling

The manufacturer is required to state if and how long a guarantee is granted and which is included in the guarantee. The manufacturer is required to state if there is an recycling concept for the sandbedmat.

ANIMAL-RELATED CRITERIA

Animal observations

During the practical use behaviour observations were executed by direct observations.

It was observed if there was some deviation from specific behaviour noticeable (e.g. typical movement process getting up and lying down, lying positions) which would have to be attributed to the sandbedmat were determined. 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

To evaluated the footedness of the cows direct observation of 20 getting-up processes each on two farms were carried out.

Figure 6:
Joint evaluation

Joint evaluation

On three farms which had installed only the tested sandbedmat, 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 7).

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 3).

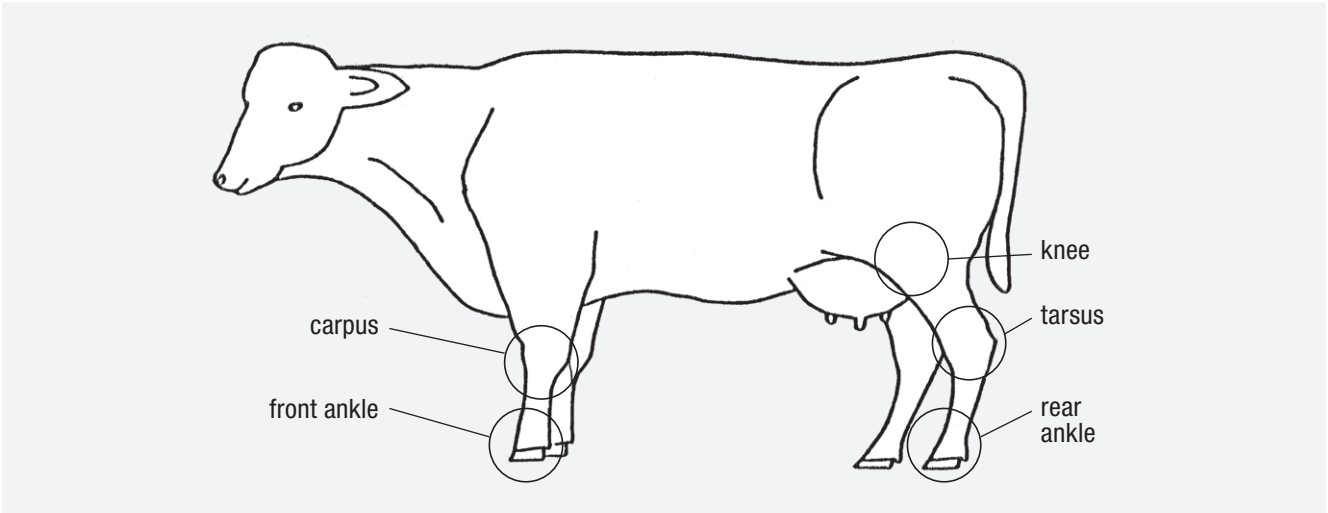

Figure 7:
The areas shown were examined

Table 3:
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

Deformability and elasticity

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).

Toxicological safety

The manufacturer has to confirm the toxicological safety of the sandbedmat.

Figure 8:
Deformation measurement

The Test Results in Detail

TECHNICAL CRITERIA

Wear resistance, durability and ageing

Permanent tread load

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 at the cross link of the sandbedmat was determined. No lasting deformation could be observed.

Acid resistance

The sandbedmat was limited resistant against feed acid mixture, barn disinfection liquid and peracetic acid.

The sandbedmat was resistant against the other test liquids. By this 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 rubber mat seems to be satisfactory suited for the described use.

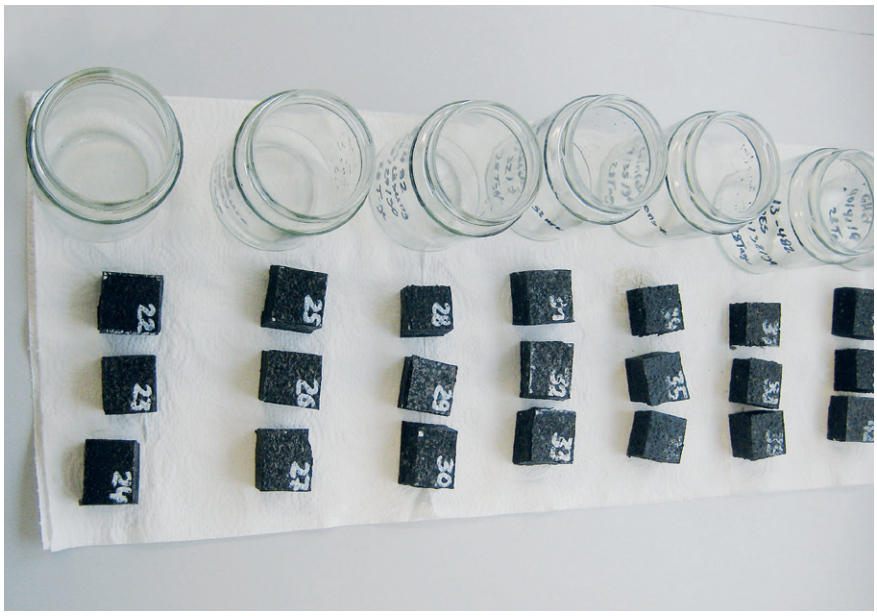

Figure 9:
Test samples after the acid test

Tabelle 3:
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	test sample with more than 25 % increase of weight	limited resistant
Excrement acids				
Uric acid	saturated urea solution (0,4 %)	no changing	no changing	resistant
Sulfurous acid	5-6 % SO_2	no changing	no changing	resistant
Ammonia solution	32 % solution	no changing	no changing	resistant
Disinfection liquid				
Barn Disinfection liquid	2 %-solution of a product with formic acid and glyoxyl acid	no changing	test sample with more than 25 % increase of weight	limited resistant
Peracetic acid	3000 ppm	no changing	test sample with more than 25 % increase of weight	limited resistant

* evaluation range see page 3 table 1

Dimensional stability

During the test period of 11 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 min. two persons. The sanbedmat are fixed with 13 screws plus disks and dowel on the anchoring supports on the floor. As maintenance continous intersperse of litter is necassary.

Cleaning

The self cleaning effect is good and the daily cleaning of the surface does not cause any difficulties. With continous intersperse of litter the resting areas are very dry and the cows are clean.

Warranty and recycling

According to its warranty conditions, the registering company grants a warranty of 5 years declining for the sandbedmat. The registering company has an recycling concept for the sandbedmat. The clean sandbedmats can send on own costs to the manufacturer. A written agreement with the manufacturer is recommended.

ANIMAL-RELATED CRITERIA

Behavioural observations

During the 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. The footedness of the cows on the sandbedmat was good, no slipping of the cows was observed.

Joint evaluation

On three farms which had installed only the tested cow mattress, a total of 105 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 7). Joint evaluation was always carried out by the same person at the end of the winter feeding period.

In two farms straw litter was used on the sandbedmat. On one farm pellets made of husk were used as litter.

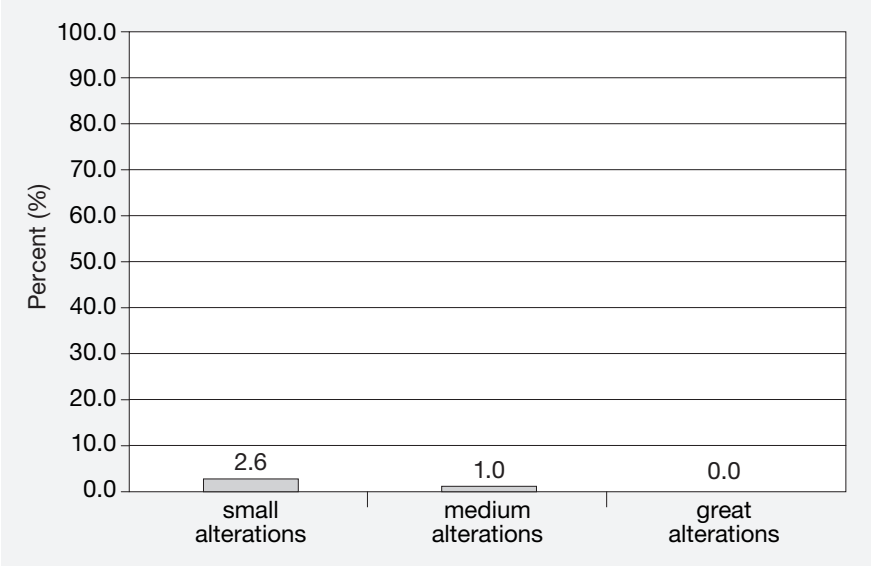

Figure 10:
Percentage of the results found

The percentage of the results found in the 105 animals examined is shown in figure 10. 96.4 % 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 2.6 % of the spots evaluated. At 1.0 % 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.

Deformability and elasticity

In ball impression tests in new condition with a calotte (r=120 mm) the deformation was measured on three different places on the sandbedmat.

The penetration depth at the sandfilling was 19.0 mm, on the link of the sandbedmat 11.5 mm and on the cross link of the sandbedmat 4.7 mm. The calculated bearing pressure were 14.0 to 56.4 N/cm².

Elasticity was measured after a permanent tread load exerted by the steel foot to the cross link of the sandbedmat. After the endurance test, the penetration depth increased from 4.7 to 5.3 mm. This means that deformability and elasticity increased little.

Suitability

The sandbedmat is suitable as an elastic floor cover in resting area of cubicles in cubicle houses.

For a good function the sandbedmat has to be filled with sand and the sand must be compacted.

Additional the sandfilled sandbedmat has to be coverd with ca. 5 cm suitable litter (e.g. chaff straw).
The litter has to be added continous.

Survey

A survey among 14 farms, which have been using the sandbedmat up to 8 years, confirmed the experiences of the test. On the farms, a total of 1807 cubicles were equipped with the sandbedmat. On 12 farms the sandbedmat was installed by the farmer. 11 of these farmers stated that installation was easy and did not require any practice.

On all of the farms the cubicles were accepted well by the animals and there were no problems with acclimatization of the cows.

In all of the farms no slipping of the animals was observed. All of the farmers observed a reduction of joint alterations. In no farm damage on the sandbedmat was observed. The sandbedmat was evaluated good by one farmer and very good 13 farmers. All farmers would purchase the sandbedmat again if necessary.

Summary

The utility value test included technical measurements on test rigs and practical tests with regard to durability and comfort properties of the New Farms sandbedmat as a system for building a lying area in cubicle barns for cows and cattle

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

The tested New Farms sandbedmat met the requirements of the Testing Framework with respect to the investigated criteria.

More information

Further test results of cow mattresses are available for download under **www.dlg-test.de/stalleinrichtungen**.
The relevant DLG committees have published various instruction leaflets on the topic of animal welfare and cattle husbandry. These instruction leaflets are available free of charge in PDF format at: **www.dlg.org/merkblaetter.html**

Test performed by

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DLG test scope

Approved Full Test „for elastic stable flooring“ (version 04/2010)

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The DLG

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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: 16-834

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