LELY

Compedes Softbed

DLG Test Report 5980

DLG SIGNUM TEST
Feb 04 passed

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DLG e.V.
Test Center
Technology and Farm Inputs

Short description

- Black animal house floor cover as a single mat made of solid rubber,
- Thickness 12 mm, in the edge area 30 mm,
- In widths of 110, 115, 120 and 125 cm,
- Length 183 cm,
- Upper side with a hammer beat structure,
- Smooth underside

The special foamed plastic underlay out of polyurethane (thickness 20 mm) installed loosely on the animal house floor is surrounded by the solid rubber mat from all sides.

The rear area of the mat features knobs and webs on the underside, which cover a width of ca. 25 cm. For this reason, the mat has a gradient of ca. 1.5 % in this rear area.

(Technical data page 6)

Evaluation – short version

Test criterion	Test result	Evaluation
Suitability		
	Suitable as an elastic floor cover in the lying area for high boxes in lying box houses. Small litter quantities are highly recommended. Single mat. Installation is also possible when the lying box partitions are fixed.	
Technical criteria		
Wear resistance, durability, and ageing (test stand trials)		
Abrasion test	Good wear resistance	+
Permanent test	Cover height decreased by 5 mm (16 %)	+
	No significant wear	+
	No damage to the cover	+
Acid test	No alterations to the cover	+
Dimensional stability		
	No alteration in length or width	+
	No significant formation of craters	+
Handling, installation		
Installation by the owner	Easy	+
Installation instructions	Detailed and understandable	+
Maintenance		
	Not necessary	○
Cleaning and disinfection		
Self-cleaning	Good	+
Daily cleaning	Does not cause any difficulties	+
High-pressure cleaner	Minimum distance 5 cm with a flat jet nozzle	+
	Minimum distance 40 cm with a coarse dirt remover	○
Efficient disinfection and thorough cleaning	Well possible	
Warranty, recycling		
Rubber mat	5 years	
Special foamed material	5 years	
Rubber mat	No recycling concept	– –
Special foamed material	No recycling concept	– –
Animal-related criteria		
Animal observations		
	No noticeable deviation from specific behavior	+
Standing and lying times	In the normal range	+
Injuries		
Joint evaluation	More than 85 % without any pathological result	+
Slip resistance		
Slip resistance during slide tests	Good on dry and wet, non-littered covers	+
Secure footing of the animals	Good on farms	+
Deformability and elasticity		
– when new	19.15 mm, very good	+ +
– after a permanent tread load test	19.0 mm, very good	+ +
Selection behavior of the animals		
	The floor cover is very well accepted by the animals.	+ +
Lying phase	Average duration longer as compared with the reference cover	+
Toxicological safety		
	Confirmed by the manufacturer	○

Evaluation range: + + / + / ○ / – / – – (○ = standard)

Prüfergebnisse

I. SUITABILITY

The animal house floor cover Lely Compedes Softbed is suitable as an elastic floor cover in the lying area of high boxes in lying box loose houses. Since it is a single mat, it can also be installed when the lying box partitions are fixed.

The condition for problem-free use is proper construction of the concrete foundation with a continuous gradient of at least 3 %, better 4 %.

The rear area of the mat itself has a gradient of ca. 1.5 %.

Additional small quantities of litter are highly recommended for proper function.

II. TECHNICAL CRITERIA

Wear resistance, durability, and ageing

In a standardized abrasion test during which the cover was ground with emery cloth (granulation 280) at a grinding pressure of 500 N (= 8.1 N/cm² surface pressure), abrasion depth after 10,000 double strokes was 3.0 mm, which corresponds to 30 % of the cover height. Of the ground surface (61.5 cm²), 9.1 g were rubbed off.

The small abrasion depth and the small abraded quantity indicate good wear resistance of the solid rubber mat used as a cover.

After exposure to a permanent tread load exerted by a steel foot (contact area 75 cm²) with 100,000 alternating loads of 10,000 N (corresponding to ca. 1,000 kg), no noticeable wear or damage to the solid rubber mat used as a cover were found. The special foamed plastic material was compressed, and a lasting deformation of approximately 5 mm was determined.

Given an initial height of ca. 32 mm, this means that the cover height decreased by only approximately 16 %, while up to 30 % is defined as standard.

An acid test according to DIN 51958 with lactic acid and butter showed no alterations to the cover, such as swelling, softening, and destruction phenomena.

Dimensional stability

During the test period, length and width did not change in practice after proper installation. In addition, no noticeable formation of craters was observed in practical use.

Handling, installation and maintenance

The instructions of installation are detailed and understandable. Installation is easy and can be carried out by the owner. 2 persons are necessary for installation. The mats are installed side by side and fixed on the head side with three bolts and dowels at three determined places. They can be reused because removal does not cause any damage.

No maintenance is required for the mats to remain functional.

Cleaning and disinfection

The self-cleaning effect is good, and daily surface cleaning does not cause any problems. Small litter quantities make it easier to keep the lying box and the animals clean and dry. The impermeable surface allows for easy, effective disinfection and thorough cleaning (e.g. with a high-pressure cleaner) Before cleaning, the dirt should be softened.

During test stand trials with a high-pressure cleaner (capacity: 1,000 l/h, approximately 145 bar, exposure period: 1 minute), damage to the cover occurred if a minimum distance of 40 cm (coarse dirt remover) or 5 cm (flat-jet nozzle) was not kept.

Moisture can collect underneath the floor cover and especially in the special foamed plastic underlay. This cannot be avoided (capillary effects). However, cleaning requires little time and effort because the

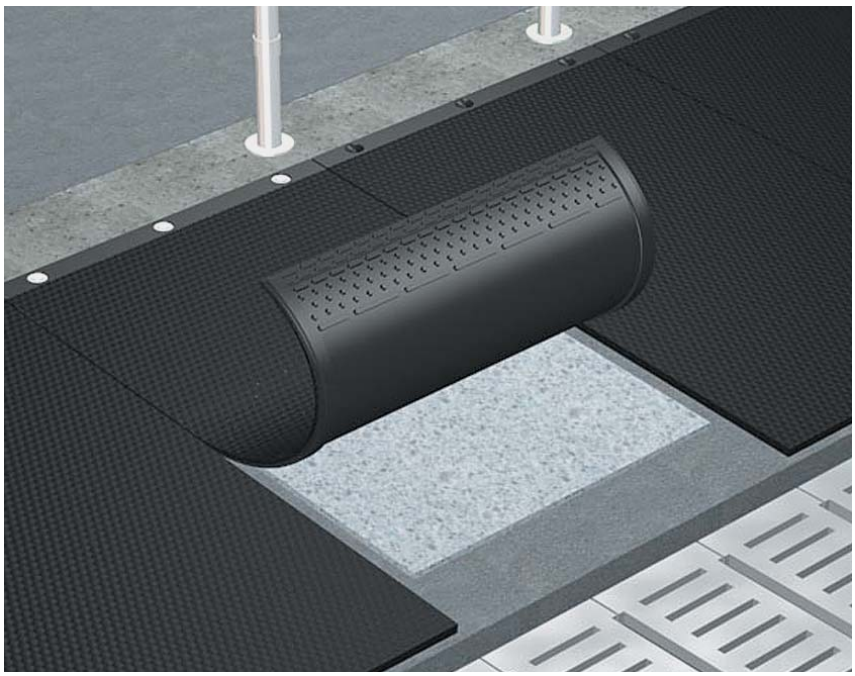

Figure 2:
System sketch of the animal house floor cover Lely Compedes Softbed

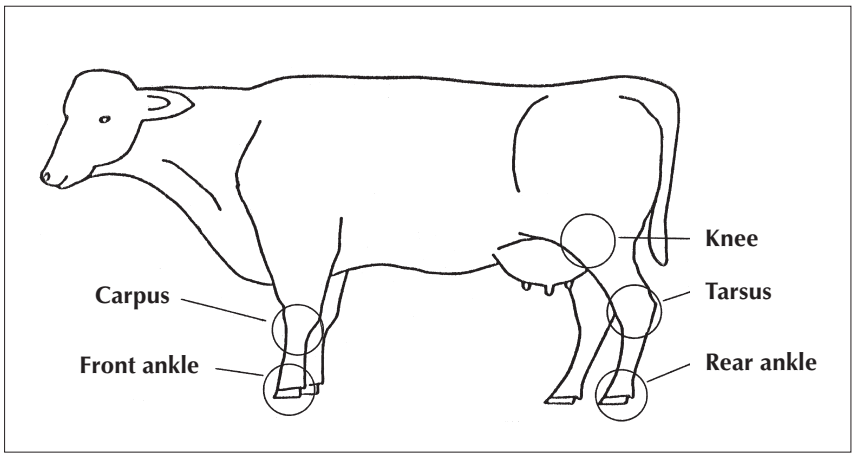

Figure 3:
The joints shown in the figure were examined.

floor cover is bolted only in the head area.

Only cleaning agents approved by the manufacturer for use on the floor cover should be used for cleaning and disinfection.

Warranty and recycling

According to the warranty conditions, the registering company grants a 5-year warranty for the rubber mat and the special foamed plastic material.

A recycling concept of the registering company for potential future utilization of the special foamed plastic material and the rubber mat does not exist. According to the registering company, the foamed PU material can be disposed of regularly.

III. ANIMAL-RELATED CRITERIA

Animal observations

During the practical test period of one year, different behavioral observations in the form of video and direct observations were carried out. No deviations from specific behavioral patterns (e.g. typical motion sequences during getting up and lying down, lying positions) caused by the floor cover were found. The direct observation of 20 getting-up sequences each on two farms did not show any deviations from the normal motion sequence. As the selection test shows, the average standing and lying times on the cover (12.9 hours) are in the normal range. When the selection test was evaluated, no interrupted lying-down sequences were observed.

Injuries

On four farms where only the tested cover was installed, a total of 100 cows beginning with animals in the second third of the lactation period were examined for externally visible damage in the joint area (joint evaluation). The evaluation included the left and the right half of the body and focused on the 10 spots exposed during lying (cf. figure 3).

The joints were evaluated at the end of the hibernal feeding period. These evaluations were always carried out by the same person. The results were classified according to the system in Table 1.

The percentage shares of the results determined in the 100 animals examined are shown in the following diagram (figure 4). 88 % of the examined spots did not show any pathological result. Significant alterations, such as increased circumference in the bursal area (open) and lameness, were not found.

Slight alterations, such as hairless spots, were found at 11.1 % of the spots examined. At 0.9 % of the examined spots, medium alterations, such as skin abrasions and increased circumference of the bursal area (covered) of the joints, were found.

The pathological results primarily occurred in the tarsus. The ankles, the knee, or the carpus showed no or only isolated results. The concentration of the results in the rear leg area must likely be attributed to increased moisture and soiling in the rear area of the lying box.

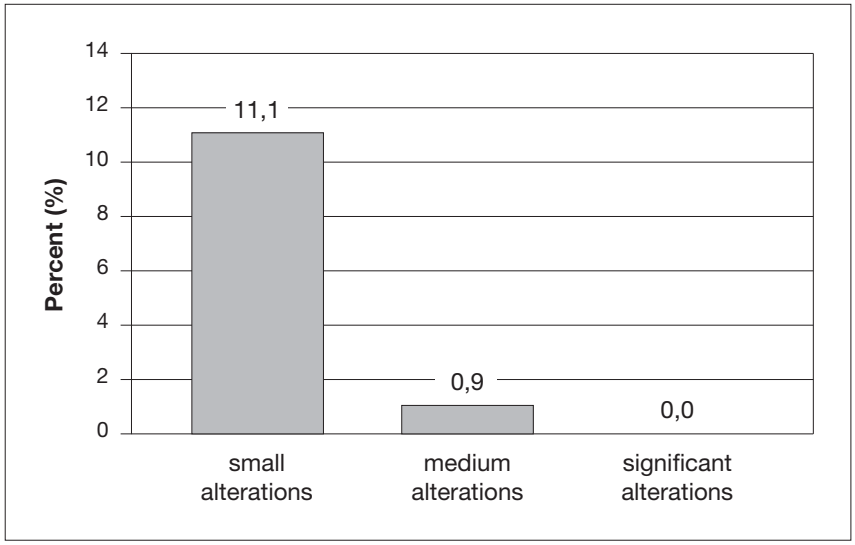

Figure 4:
Percentage shares of the determined results.

Table 1:
Classification of the results

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	Significant alterations
Joint participation	Significant alterations

Slip resistance

Slide pulling tests with a round plastic foot (contact area 75 cm²) at sliding velocities of the plastic foot of 16 to 400 mm/min showed very good slip resistance on the dry and wet, non-littered cover. The measured friction coefficients (μ) exceed the minimum value of μ = 0.45.

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

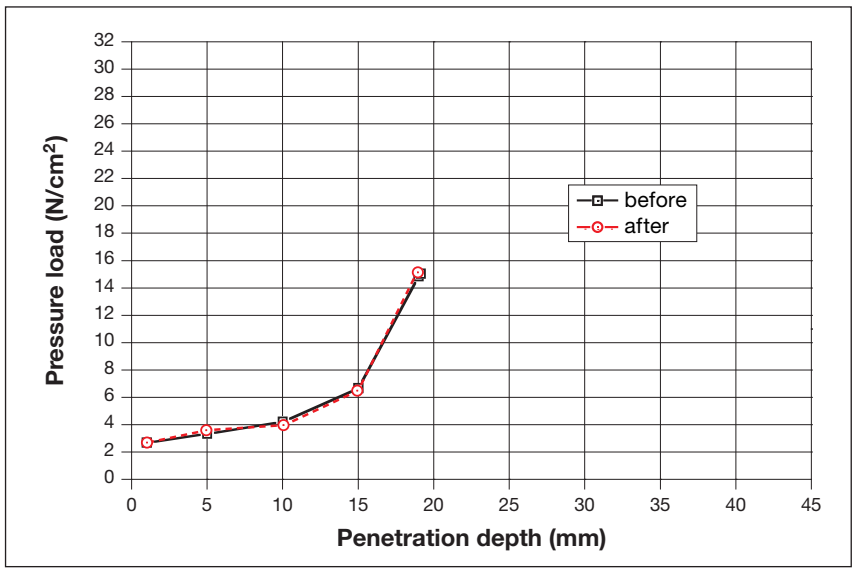

Figure 5:
Deformability, penetration depth of the calotte (r = 120 mm) depending on the penetration force.

Deformability and elasticity

In ball impression tests of the new cover with a calotte (r = 120 mm) at a penetration force of 2,000 N (corresponding to ca. 200 kg), penetration depth was 19.15 mm. This corresponds to a bearing pressure of 15.0 N/cm², which indicates a relatively small load on the carpal joints during lying down and getting up.

Elasticity was measured after exposure to a permanent tread load with a steel foot (contact area 75 cm²) with 100,000 alternating loads of 10,000 N. After the endurance test, the penetration depth of the calotte under a pressure of 2,000 N decreased from 19.15 mm to 19.0 mm. This corresponds to an increase in bearing pressure from 15.0 N/cm² to 15.1 N/cm² (cf. figure 5). This means that

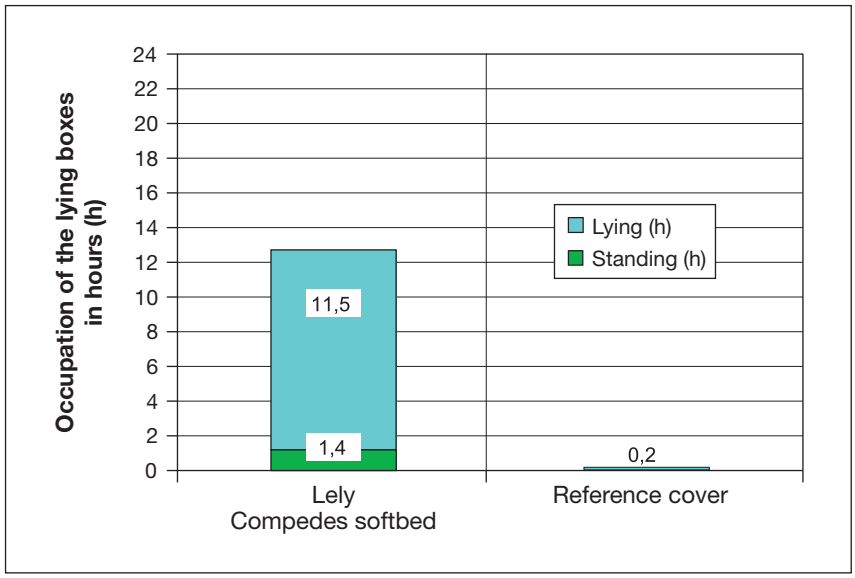

Figure 6:
Result of the selection test with 4 cows and 8 lying boxes (of these: 4 lying boxes with the tested cover / 4 lying boxes with a reference cover (solid rubber mat))

deformability and elasticity decrease only very slightly.

Selection behavior of the animals

A selection test with video observation in a lying box house (number of pens: 8, number of animals: 4, adaptation period: at least 2 weeks, recording time: 7 days) with a solid rubber mat (thickness: 18 mm, upper side: hammer beat structure, under side: groove structure) as a reference mat showed that this cover is accepted very well. Lying behavior does not show any deviations from normal lying behavior. Interrupted lying-down processes were not observed.

The evaluation of the video recordings showed that the animals spent an average of 13.1 hours standing and lying in the lying boxes during 24 hours. Of these, the animals spent 12.9 hours in the lying boxes with the Lely Compedes Softbed and only 0.2 hours in the lying boxes with the solid rubber mat.

The average duration of a lying phase on the Lely Compedes Softbed was also higher than the lying phase on the solid rubber mat.

Toxicological safety

The manufacturer confirmed the toxicological safety of the floor cover.

IV. SURVEY RESULT

A survey among 21 farms, which have been using the animal house floor cover for up to seven years, confirmed the experiences gained during this test.

On the farms, a total of 1,094 lying boxes were equipped with the floor cover. On all farms, the cover was installed by the farmer. 95 % of the farmers stated that installation was easy and did not require any practice or experience.

On all farms, the lying boxes were very well accepted by the animals.

Of those surveyed, 62 % stated that they did not observe animals slipping.

100 % of the farmers surveyed noticed a reduction of slight injuries after the installation of the cover.

The cover is given a good to very good overall evaluation by 90 % of those surveyed, and 95 % would purchase it again if necessary.

Description and technical data (measured values)

Main measurements and weight

Cover material		Special foamed material
Thickness (center, edge area)	ca. 12 to 32 mm	ca. 22 mm
Weight	ca. 20 kg/m²	ca. 3.5 kg/m²

Available measurements

Cover		Special foamed material
Width	110, 115, 120 and 125 cm	identical with the mat
Length	183 cm	identical with the mat

Warranty

5 years for the rubber mat and the special foamed material

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Test

The DLG SignumTest included technical measurements on test stands, practical tests, behavioural observations, joint evaluations, and a survey among farms.

The test stand trials comprised tests of deformability and material hardness with the aid of a ball impression test, examinations of the permanence of elasticity by means of exposure to alternating loads, tests of abrasion resistance by means of an abrasion test with emery cloth, the determination of slip resistance in slide pulling tests, and examinations of surface resistance to lactic acid and butter according to DIN 51958.

The selection behavior of the animals was recorded with the aid of a video camera in a lying box house of the Agricultural Center Haus Düsse.

Realization of the tests

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