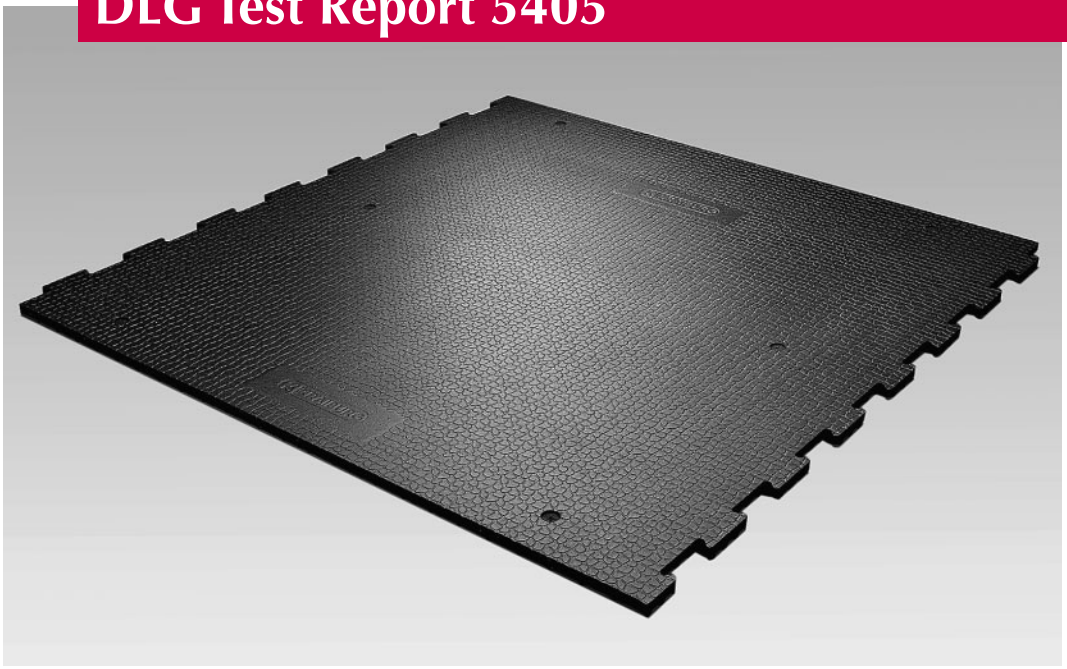
Gummiwerk Kraiburg Elastik GmbH

Kraiburg Walking Surface Cover for Cattle, Type KURA P

DLG Test Report 5405



DLG SIGNUM TEST
Oct 2004 passed

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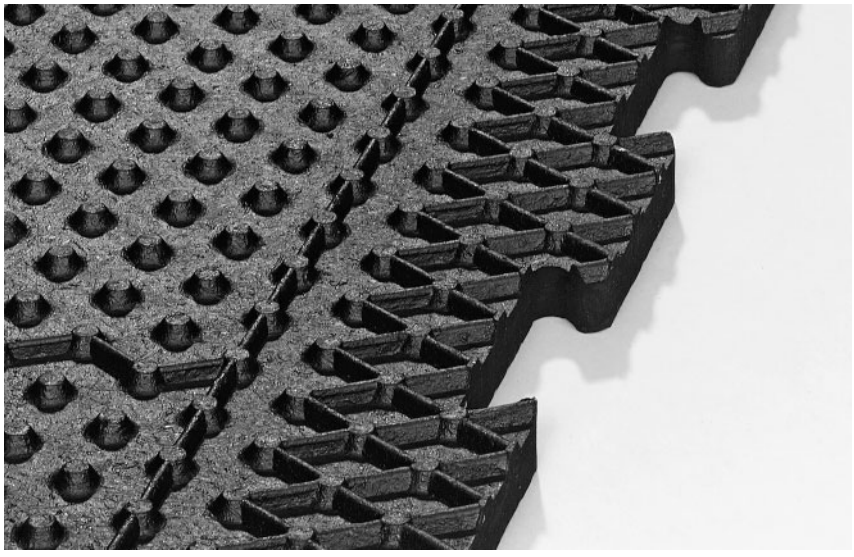
Short Description

- Black, profiled slatted floor coating out of rubber, 24 mm thick
- Surface with a grip profile
- Under side: knob structure (height of the knobs: 5 mm) with dirt barriers (every 30 cm) and a reinforced puzzle area
- Installation in the form of interlocked parts as a puzzle

(Technical data cf.page 6)



German Agricultural Society
Test Centre for
Agricultural Machinery

Evaluation – short version

Test criterion	Test result	Evaluation
Suitability		
	Suitable as a walking surface cover	
	for level concrete walkingareas in cattle stalls	

TECHNICAL CRITERIA

Resistance to wear, durability, and ageing (test stand trials)		
Abrasion test	good resistance to wear	+
Continuous tread load	no lasting deformation	++
Surface	no noticeable wear	+
Underside	no noticeable wear	+
Acid test	no alterations to the cover	+
Dimensional stability	no noticeable alteration in length or width	+
Deformation	none	+ +
Handling, installation		
Installation by the owner	requirements within reasonable limits	○
Fastening	stable and safe	+
Instructions of installation	detailed and easily understandable	+ +
Cleaning	No difficulties if a suitable scraper is used	+
High-pressure cleaner	Minimum distance 10 cm with a flat-jet nozzle	+
	Minimum distance 30 cm with a coarse dirt nozzle	+
Warranty, recycling		
	5 years	
	Mat is taken back by the manufacturer	+

ANIMAL-RELATED CRITERIA

Behavioural observations		
Motion behaviour	increased activity	+
Comfort-/oestrous behaviour	pronounced	+
Slip resistance		
Slip resistance during sliding tests	good	+
Footing safety	good	+
Claw evaluation		
Mechanical-traumatic results	significant positive influence	+ +
Form of bearing surface	projecting in more than 50% of the claws	+
Deformability and elasticity		
In new condition	3.5 mm, very good	+ +
After exposure to continuous tread load	3.45 mm, very good	+ +
Toxicological safety		
	Confirmed by the manufacturer	○

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

Test results

I. SUITABILITY

The walking surface cover type KURA P from Kraiburg is suitable as a floor cover for level concrete walking areas in cattle stalls. The individual mats are installed in the form of interlocked parts like a puzzle. Problem-free use requires that a demanuring scraper specially developed for rubber floors is used. Existing scrapers in altered stalls must be adapted according to the requirements of the company Kraiburg.

II. TECHNICAL CRITERIA

Resistance to wear, durability, and ageing

In a standardized abrasion test, the floor was rubbed with emery cloth (grit size: 280) at a pressure of 500 N (area pressure: 8.1 N/cm^2). After 10,000 double strokes, abrasion depth was 0.8 mm. This corresponds to ca. 3% of the cover height. Of the rubbed surface (61.5 cm^2), 1.5 g were abraded. Small abrasion depth and little abrasion therefore allow the conclusion to be drawn that the abrasion resistance of the floor cover is good.

After exposure to a continuous tread load on a test stand exerted by a steel foot (contact area: 75 cm^2), no noticeable wear (surface and under side) and no damage to the walking surface cover were determined after 250,000 alternating loads of 5,000 N (corresponding to ca. 500 kg). Lasting deformation was not found.

An acid test with lactic acid according to DIN 51 958 did not show any damage to the cover, such as signs of swelling, softening, or destruction.

Dimensional stability

After proper installation, noticeable length- or width alteration did not occur in practical use during the test period.

Deformation was not observed.

Handling, installation

The instructions of installation are detailed and easily understandable thanks to the illustrations (A CD-ROM with an installation sequence is also included). An instruction leaflet for scraper demanuring gives important tips for the design and the use of a demanuring scraper.

The cover can be installed by the stall owner. Installation requirements are within reasonable limits. The mats are interlocked like a puzzle and fixed at determined spots using eight nail dowels (type SK 8 x 80/40 A2 with washers). The fixing of the walking surface cover has proven stable and safe during the test period. A final evaluation of the fixing system was not possible.

Cleaning / soiling

If a suitable scraper is used, the demanuring of the walking surface cover does not cause any difficulties. During test stand trials with a high-pressure cleaner (approximately 145 bar, cleaning time: 1 minute), damage to the cover only occurred if a minimum distance of 30 cm during use with a coarse dirt nozzle and 10 cm during use with a flat-jet nozzle was not kept. Underneath the walking surface cover, moisture (urine and faeces) accumulate. This cannot be avoided.

In order to clean and disinfect the cover, only agents should be used which the manufacturer has approved for the cover.

Warranty and recycling

According to the warranty conditions, the manufacturer grants warranty for 5 years. If the customer assumes the costs of freight, the manufacturer takes the cover back in clean condition. The manufacturer has promised in writing to take the mat back.

III. ANIMAL-RELATED CRITERIA

Behavioural observations

The behavioural observations were carried out in a lying box loose house of the test farm, where ca. 120 dairy cows of the races Simmental (100 cows) and German Holstein (20 cows) were kept.

Motion behaviour

After the installation of the walking surface cover, the motional activity of the cows increased significantly. The motions were smooth and relaxed. During the direct observation of ten randomly chosen animals, strides of 64 to 82 cm were measured while the gait of the animals was smooth and even. As compared with the reference farm, the average stride was slightly longer. Due to increased motional activity, the animals slip without their behaviour being visibly impaired.

The position of the head during walking was observed in 30 animals. In these observations, a distinction was made between a high position of the head (i.e. the angle between the neck-withers line and the extended back line is smaller than 20°) and a low position of the head (angle larger than 20°). 70% of the animals observed showed a high position and 30% a low position of the head. A high position of the head speaks in favour of secure, relaxed motions.

TTable 1:
Evaluation criteria for claws

Evaluation bearing surface	
Ü (1-3)*	Projecting bearing surface
R (1-3)*	Round wall
Mechanical-traumatic results	
DS	double sole
D	press mark
R 6	pressure laminitis (laminitis due to excess load)
RSG	claw sole ulcer at the typical pressure point of the claw under load
KSG	claw sole ulcer
WD	white line defect
LW	loose wall
WL	wall lesion / wall ulcer
Rot	rotating claw (one claw is pulled up at the top due to sinew alteration)
SD	tip defect
Infections and other results	
F	rot;
	1 = diffuse; 2 = V- or layer-shaped furrows; 3 = corium exposed
R	laminitis;
	1-3 sub-acute form; 4-5 chronic and chronic-recurring form (laminitis claw)
Z	phlegmon between the claws / panaritium
M	Mortellaro´s disease (degree of severeness 1-3)
Li	Limax (tylome / bulge between the claws)
VK	enlarged claw, front: outer claw; rear: inner claw
ZW	wound / inflammation of the skin between the claws

*1-3 describes the percentage of the wall affected in thirds of total length

Comfort- and oestrous behaviour

Over a period of one hour, a total of 30 active animals were observed (dairy cows which neither rested in a lying box nor ate at the feeding table). During this time, licking in the rear part of the body was observed 13 times. In all cases, the animals stood securely on three legs.

In the form of frequent covering, oestrous behaviour was quite pronounced. Both the covering and the covered dairy cows stood securely on the walkingarea cover without slipping.

After the installation of the walking surface cover, no increase in the number of animals lying in the walkingarea was observed on the test farm. If the lying boxes are not equipped optimally, there is a growing risk of animals lying in the walkingarea more often.

Claw evaluation

During the test period, the claws of all cows on the test farm were trimmed and evaluated three times. Only those cows (60 animals) were assessed which were able to be examined on all three evaluation dates. The results were registered based on fixed evaluation criteria (cf. table 1). At the time of the first evaluation, which was carried out two weeks before the installation of the walking surface cover, the animals stood on a mastic asphalt cover. Three months after installation, the second evaluation was carried out followed by the third assessment six months later. Claw evaluation also included the measurement of the dorsal wall length (cf. figure 2) of the claws.

Claw diagnoses

Figure 3 shows the number of mechanical-traumatic results among the 60 animals examined on the individual evaluation dates. Before the installation of the walking surface cover, 362 mechanical-traumatic results per 100 cows were registered. In principle, all diagnostic criteria were applied to every claw. Therefore, it was possible that more than one diagnosis per claw was made.

After the installation of the walking surface cover KURA P, just 70 mechanical-traumatic results were found after nine months. Thus, a clearly positive influence on the reduction of mechanical-traumatic results was recorded.

The number of infections (rot and Mortellaro) per 100 animals is shown in Figure 4.

Before the installation of the walking surface cover, 40 infections per 100 cows were found on the test farm. It was possible that more than one diagnosis per claw was made.

After the installation of the walking surface cover KURA P, just 33 infections were found after nine months.

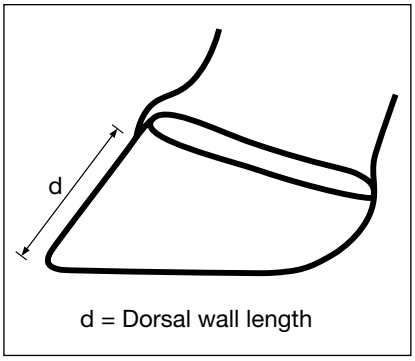


Figure 2:
Dorsal wall length of the claw

The chart shows that other factors in addition to the walking surface cover have an influence on the number infections found.

Shape of the bearing surface

Figure 5 shows the effects of the bearing surface on the shape of the bearing surface: Before the installation of the walking surface cover, a round wall was found in 92% of the claws. After nine months on the walking surface cover KURA P, a protruding bearing surface was determined in 75% of the claws.

Dorsal wall length of the claws

After a housing time of six months on the walking surface cover KURA P, the average length of the dorsal wall of the claw had increased by 0.5 cm. Therefore, the claws should be trimmed at least twice per year.

Slip resistance

Sliding-pulling tests with a round plastic foot (contact area: 75 cm^2) at a speed of 20 mm/s showed good slip resistance on a dry and a wet new cover. After 3 months of practical use, the sliding-pulling tests were repeated at a minimum of 12 points in the stall (at least three points per walkingarea).

The measured friction coefficients (μ) were all above the minimum of μ = 0.45, which indicates secure footing. During the production of the walking surface cover, a silicone release agent is used. For this reason, secure footing is impaired at the beginning. This silicone film disappears after a few days.

Deformability and elasticity

During ball impression tests in new condition with a steel foot (contact area: 75 cm^2) at a penetration force of 2,000 N (corresponding to 200 kg), penetration depth was 3.5 mm.

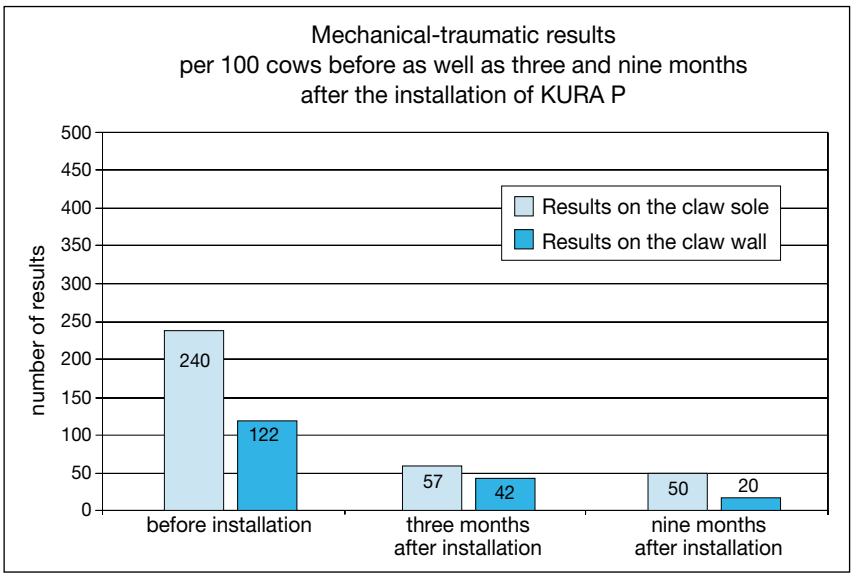


Figure 3:
Number of mechanical-traumatic results

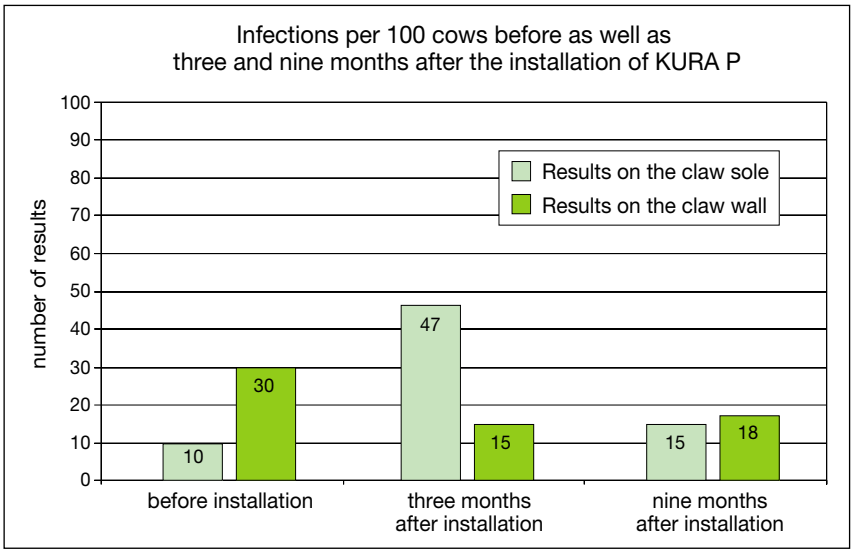


Figure 4:
Number of infections

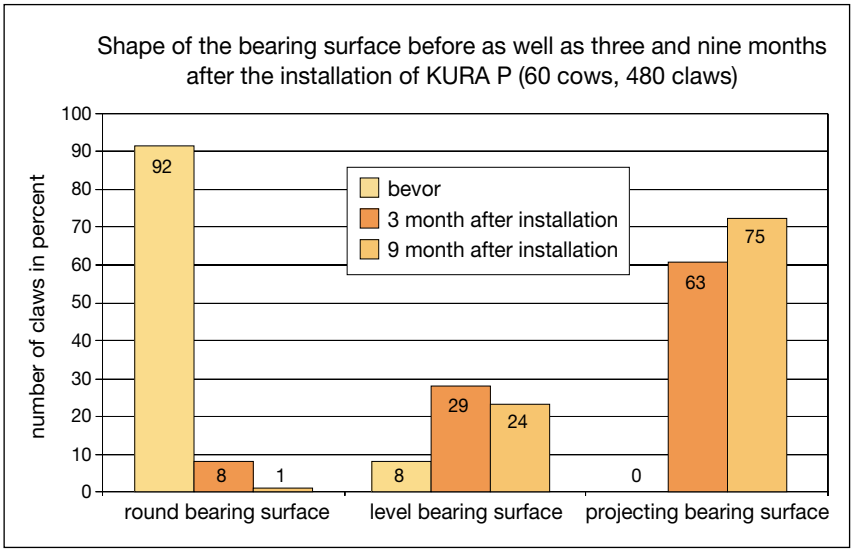


Figure 5:
Shape of the bearing surface before as well as three and nine months after the installation of KURA P (60 cows, 480 claws)

Elasticity was measured after exposure to a continuous tread load exerted by a steel foot (contact area: 75 cm^2) in the form of 250,000 alternating loads of 5,000 N. After the long-term trial, the penetration depth of the steel foot diminished from 3.5 mm to 3.45 mm (average values of three measurements each). This means that deformability decreases very slowly.

Toxicological safety

The manufacturer confirmed the toxicological safety of the floor cover.

IV. SURVEY RESULT

A survey among 16 farms which have used the walking surface cover for up to two years confirmed the test results.

On the farms, a total of 3,960 m^2 of the walking surface cover were installed. On 65% of the farms, the cover was installed by the stall owner. 75% of those questioned stated that installation was easy and practical.

On 44% of the farms, a new demanuring scraper, which is suitable for rubber floors, was installed. On 56% of the farms, the existing scraper was adapted.

On 12% of all farms, scraper demanuring caused problems at the beginning. Now, the demanuring scrapers work without problems on all farms.

On approximately 81% of the farms, a considerable change in animal behaviour (altered head position and more active oestrous behaviour) was found. On two farms, some cows lie in the walkingareas after the walking surface cover has been installed.

On 87% of the farms, signs of mechanical-traumatic claw injuries decreased. Claw alterations (bearing surface, claw length) were found on 62% of the farms.

All those questioned gave the walking surface cover KURA P good to very good overall evaluations and would buy it again if they needed a new cover.

Description and technical data

Warranty

5 years

Available sizes

Customized in 2 cm steps for any walkingarea width

Main measurements and weight

(per individual mat)

Length	1,250 mm
Width	960 mm to 3,500 mm in steps of 2 cm
Thickness	24 mm
Weight per m^2	ca. 22 kg

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Tests

The DLG SignumTest is based on the technical measurements on the test stands of the DLG Test Station as well as practical tests, behavioural observations, claw evaluation, and a survey among farms.

On the test stands, deformability and material hardness were tested in an impression test, durability and elasticity were measured by means of alternating loads, resistance to abrasion was determined in an abrasion test with emery cloth, slip resistance was established by means of sliding-pulling tests, and the resistance of the surface to lactic acid was tested according to DIN 51 958.

Realization of the tests

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