DLG Test Report 6957

Promat Inc.

Cow Mattress Pasture Mat
with 40 mm Comfortpad and HRC Top Cover

Deformability/Elasticity, Permanent Tread Load,
Acid resistance

APPROVED 2019 DLG WWW.DLG.ORG

PROMAT PASTURE MAT WITH 40 MM COMFORTPAD AND HRC TOP COVER

- ✓ Deformability/Elasticity
- ✓ Permanent Tread Load
- ✓ Acid resistance

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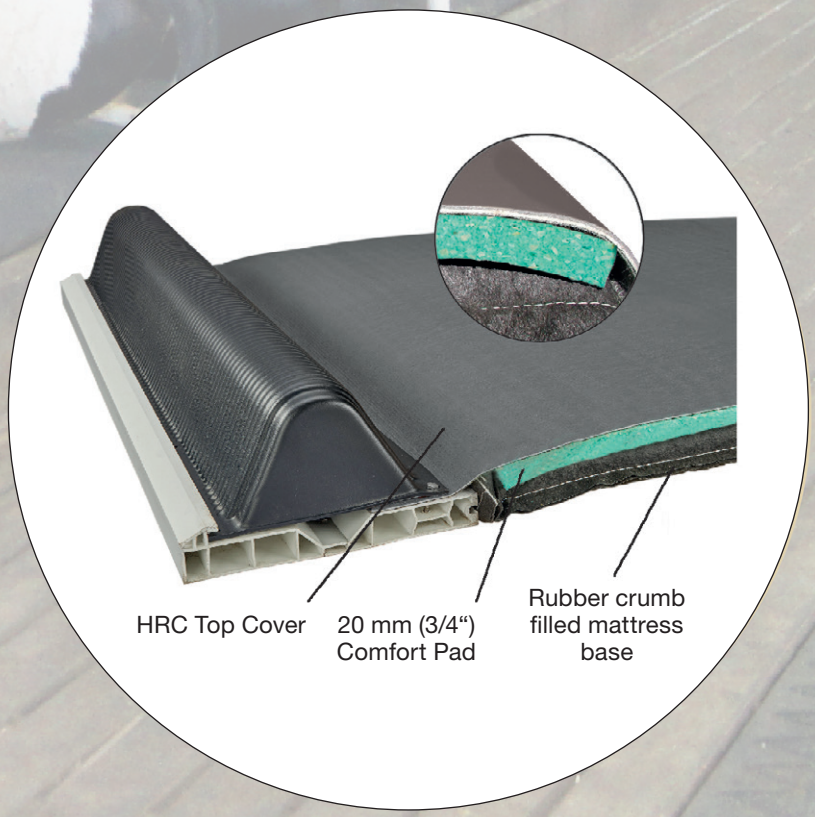

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Overview

A test mark „DLG-APPROVED for individual criteria“ is awarded for agricultural products which have successfully fulfilled a scope-reduced usability testing conducted by DLG according to independent and recognized evaluation criteria. The test is intended to highlight particular innovations and key criteria of the test object. The test may contain criteria from the DLG test scope for overall tests, or focus on other value-determining characteristics and properties of the test subject. The minimum requirements, test conditions and procedures as well as the evaluation bases of the test results will be specified in consultation with an expert group of DLG. They correspond to the recognized rules of technology, as well as scientific and agricultural knowledge and requirements. The successful testing is concluded with the publication of a test report, as well as the awarding of the test mark which is valid for five years from the date of awarding.

The DLG Approved Test “Deformability/Elasticity, Permanent Tread Load, Acid resistance” includes technical measurements on test stands of the DLG Test Center. The deformability and elasticity, the acid resistance, were measured and a permanent tread load was applied. The test was based on the DLG Testing Framework for elastic stable flooring, current as at April 2010. Other criteria were not investigated.

Assessment – Brief Summary

The Promat cow matress Pasture Mat with 40 mm Comfortpad and HRC Top Cover tested here, an elastic floor for cubicles in cubicle houses, was investigated with regard to durability and comfort properties on test stands in the DLG Approved Test. The deformability and elasticity, the acid resistance, were measured and a permanent tread load was applied.

Table 1:
Overview of results

Test characteristic	Test result	Evaluation*
Deformability and elasticity		
– in new condition	42.6 mm, very good	+ +
– following endurance test	43.0 mm, very good	+ +
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	+

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

The Product

Manufacturer and Applicant

Promat Inc., 594711 County Rd. 59 South, Woodstock Ontario

Product:
Cow Mattress Pasture Mat with 40 mm Comfortpad and HRC Top Cover

Contact:
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Description and Technical Data

The Promat cow mattress Pasture Mat with 40 mm Comfortpad and HRC Top Cover tested here, is an elastic floor for cubicles in cubicle houses, thickness approx. 70 mm

- black polypropylene mat, thickness approx. 6 mm
- upper without structure
- underside felt
- mattress underlay made of green-white PU foam, approx. 35 mm thick, and hoses filled with rubber granulate
- seamless installation

The Method

Deformability and elasticity

The deformability is measured in new condition and following permanent tread load with a round steel foot (diameter of 105 mm and therefore a contact area of 75 cm²) and a penetration force of 2,000 N (corresponding to approx. 200 kg).

Permanent tread load

The permanent tread load is carried out 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. 1000 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.

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 mm 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.

The Test Results in Detail

Deformability and elasticity

In the ball penetration tests in new condition with a calotte (r = 120 mm), penetration depth was 42.6 mm. The resulting calculated bearing pressure of 6.2 N/cm² indicates a very low load on the carpal joints when lying down and getting up.

Elasticity was measured following a permanent tread load exerted by a steel foot (contact area: 75 cm²) with 100,000 alternating loads at 10,000 N. Following the endurance test, the penetration depth of the calotte increased from 42.6 mm to 43.0 mm. The bearing pressure decreased from 6.2 N/cm² to 6.1 N/cm² (see Fig. 2). This means that deformability and elasticity slightly decrease.

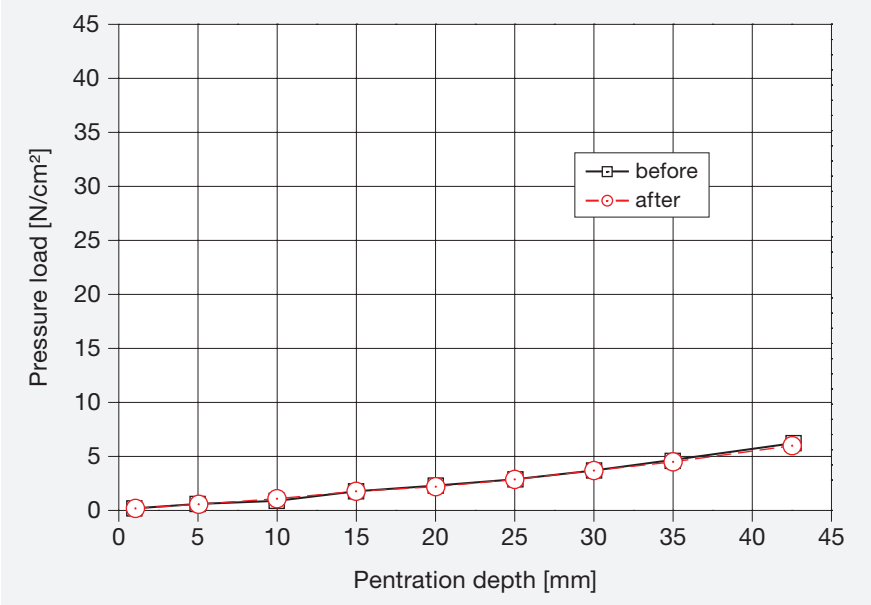

Figure 2:
Deformability as a function of bearing pressure

Permanent tread load

No noticeable wear on the surface or the foam of the mat was observed following exposure to permanent tread load on a test stand with 100,000 alternating loads at 10,000 N. No lasting deformation was observed.

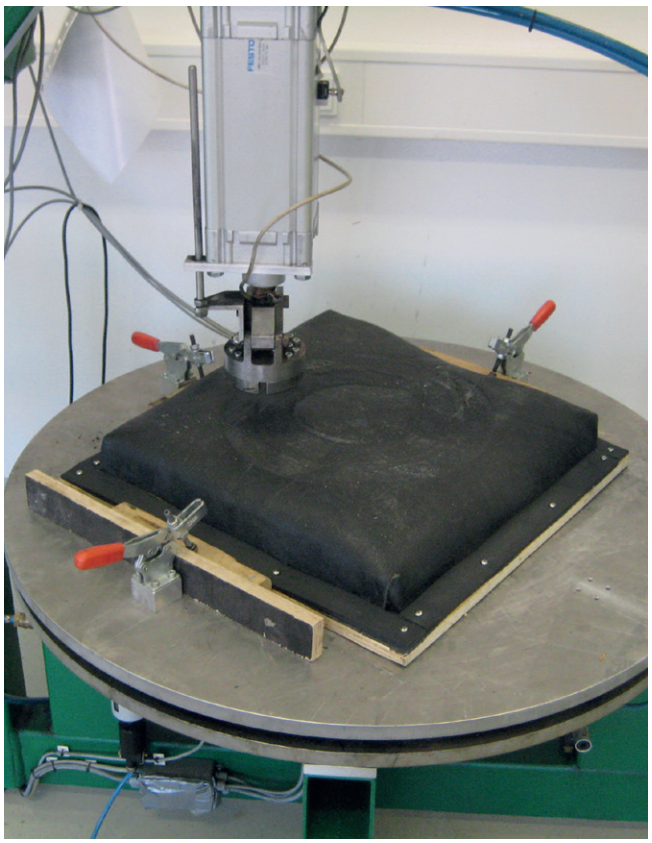

Figure 3:
Permanent tread load

Figure 4:
Measuring the deformability

Acid resistance

The cover mat was resistant against the used test 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 good suited for the described use.

The results of the acid resistance test are shown in table 2.

Table 2:
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	no changing	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	no changing	resistant
Peracetic acid	3000 ppm	no changing	no changing	resistant

Summary

Based on test-stand investigations, the criteria tested in this DLG Approved Test evaluate the comfort and durability properties of the Promat cow mattress Pasture Mat with 40 mm Comfortpad and HRC Top Cover for use in the resting area of high cubicles in cubicle houses.

The tested cow mattress met the requirements of the Testing Framework with respect to the investigated criteria.

More information

Testing agency

DLG TestService GmbH,
Gross-Umstadt location

The tests are conducted on behalf of DLG e.V.

DLG test framework

DLG Approved Test “Elastic Stable Flooring” (current as of 04/2010))

Department

Indoor operations

Head of Department

Dr. Michael Eise

Test engineer(s)

Dr. Harald Reubold*

* Author

DLG – the open network and professional voice

Founded in 1885 by the German engineer Max Eyth, DLG (Deutsche Landwirtschafts-Gesellschaft – German Agricultural Society) is an expert organisation in the fields of agriculture, agribusiness and the food sector. Its mission is to promote progress through the transfer of knowledge, quality standards and technology. As such, DLG is an open network and acts as the professional voice of the agricultural, agribusiness and food sectors.

As one of the leading organisations in the agricultural and food market, DLG organises international trade fairs and events in the specialist areas of crop production, animal husbandry, machinery and equipment for farming and forestry work as well as energy supply and food technology. DLG’s quality tests for food, agricultural equipment and farm inputs are highly acclaimed around the world.

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Internal test code DLG: 18-697

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