

DLG Test Report 6227 F

DeLaval

Cow mattress M40SB

Deformability/Elasticity, Permanent Tread Load



08/14 Deformability/Elasticity,
Permanent tread load



Test Center
Technology and Farm Inputs

www.DLG-Test.de

Overview

The Focus Test is a DLG usability test intended to allow product differentiation and special highlighting of innovations in machinery and technical products used primarily in agriculture, forestry, horticulture, fruit cultivation and viticulture, as well as in landscape and municipal management. This test focuses on testing a product's individual qualitative criteria, e.g. fatigue strength, performance,

or quality of work. The scope of testing can include criteria from the testing framework of a DLG Signum Test, the DLG's extensive usability test for technical products, and concludes with the publishing of a test report and the awarding of a test mark.

The DLG Focus Test "Deformability/Elasticity, Permanent Tread Load" includes technical measure-

ments on test stands of the DLG Test Center. The deformability and elasticity were measured and a permanent tread load was applied. The test was based on the DLG Testing Framework for elastic stable flooring, as at April 2010. Other criteria were not investigated.



Assessment – Brief Summary

The DeLaval cow mattress tested here, an elastic floor covering for the resting area of stanchion-tied stables, was investigated with regard to durability and comfort properties on test stands in the DLG Focus Test. The deformability and elasticity of the mattress were measured and a permanent tread load was applied. The deformability and elasticity in new condition and following permanent tread load were significantly better than standard.

Table 1: Overview of results

Test characteristic	Test result	Evaluation*
Deformability and elasticity		
– in new condition:	15.7 mm, very good	++
– later endurance test:	17.9 mm, very good	++
Permanent tread load		
no lasting deformation		++
slight wear after 500,000 footsteps		○

* Evaluation range: ++ / + / ○ / - / -- (○ = standard)

The Product

Manufacturer and Applicant

DeLaval International AB
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21509 Glinde/Germany

Product:
DeLaval cow mattress M40SB

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Description and Technical Data

The M40SB cubicle mattress tested here is an elastic floor covering for the resting area of stanchion-tied stables; it has a thickness of approx. 40 mm.

- Top cover:
black rubber mat, upper side with hammer beat structure,
underside smooth with fabric, thickness approx. 8 mm
- Shore A hardness: approx. 65
- Mattress underlay made of approx. 30 mm thick PU foam sheet
- Laid as sheeting

The Method

Deformability and elasticity

The deformability is measured in new condition and following permanent tread load using ball penetration tests with a calotte ($r = 120 \text{ mm}$) and a penetration force of 2,000 N (corresponding to approx. 200 kg).

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). In addition to the standard test programme of 100,000 alternating loads, be-

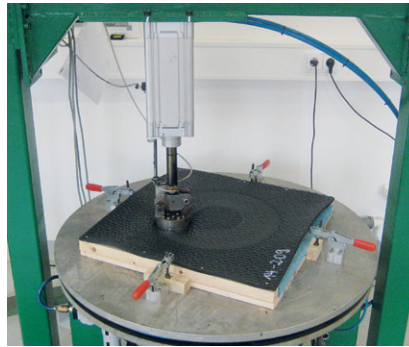


Figure 2: Permanent tread load

cause of the use in the resting area of stanchion-tied stables further 400,000 alternating loads were applied. The steel foot is adapted to the natural conditions as an "artificial cow foot". The foot has a dia-

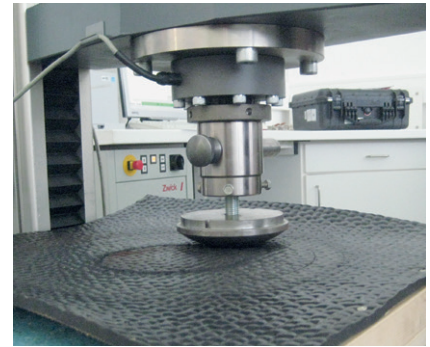


Figure 3: Measuring the deformability

meter of 105 mm and therefore a contact area of 75 cm^2 ; 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.

Die Testergebnisse im Detail

Deformability and elasticity

In the ball penetration tests in new condition with a calotte ($r = 120 \text{ mm}$), penetration depth was 15.7 mm. The resulting calculated bearing pressure of 16.9 N/cm^2 in-

dicates a relatively small 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 cm^2)

with 500,000 alternating loads at 10,000 N. Following the endurance test, the penetration depth of the calotte increased from 15.7 mm to 17.9 mm. The bearing pressure decreased from 16.9 N/cm^2 to 14.8 N/cm^2 (see Fig. 2). This means that deformability and elasticity slightly increase.

Evaluation see Table 1.

Permanent tread load

Slight wear was observed on the top cover following exposure to permanent tread load on a test stand with 500,000 alternating loads at 10,000 N. No lasting deformation was observed.

Evaluation see Table 1.

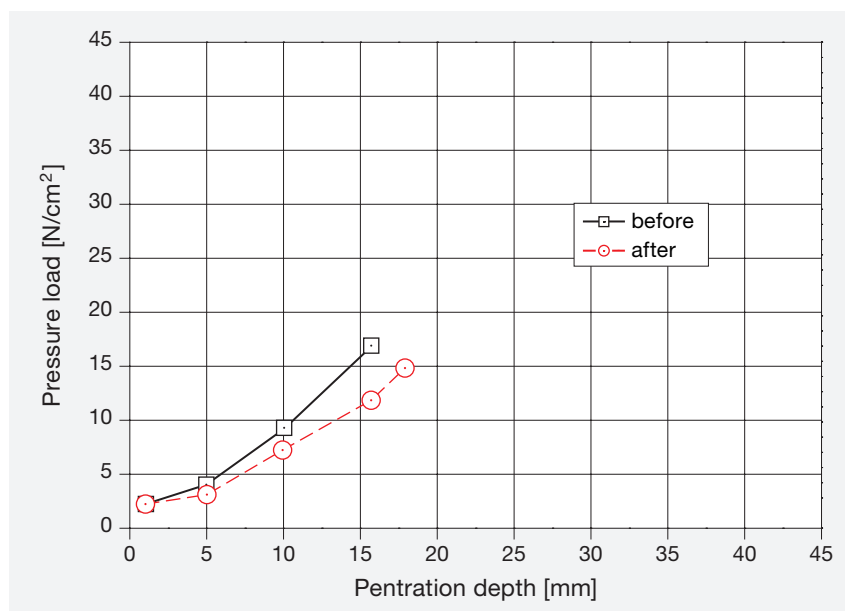


Figure 4:
Deformability as a function
of bearing pressure

Fazit

Based on test-stand investigations, the criteria tested in this DLG Focus Test evaluate the comfort and durability properties of the DeLaval cow

mattress M40SB for use in the resting area of stanchion-tied stables. The tested DeLaval M40SB mattress met the requirements of the Testing

Framework with respect to the investigated criteria.

Further Information

Further test results for cubicle flooring are available to download at www.dlg-test.de/stalleinrichtungen. The relevant DLG committees have published various instruction leaflets on the topics of animal welfare and cattle farming. These are available free of charge in PDF format at www.dlg.org/merkblaetter.html.

Test execution

DLG e.V.,
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DLG Testing Framework

"Elastic Stable Flooring"
(as at 04/2010)

Field

Indoor operations

Project manager

Dipl.-Ing. agr. Susanne Gäckler

Test engineer(s)

Dr Harald Reubold*

* Reporting engineer

The DLG

In addition to conducting its well-known tests of agricultural technology, farm inputs and foodstuffs, the DLG acts as a neutral, open forum for knowledge exchange and opinion-forming in the agricultural and food industry.

Around 180 full-time staff and more than 3,000 expert volunteers develop solutions to current problems. More than 80 committees, working groups and commissions form the basis for expertise and continuity in technical work. Work at the DLG includes the preparation of technical information for the agricultural sector in the form of instruction leaflets and working documents, as well as contributions to specialist magazines and books.

The DLG organises the world's leading trade exhibitions for the agriculture and food industry. In doing so, it helps to discover modern products, processes and ser-

vices and to make these transparent to the public.

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The DLG Test Center Technology and Farm Inputs

The DLG Test Center Technology and Farm Inputs in Groß-Umstadt sets the benchmark for tested agricultural technology and farm inputs and is the leading provider of testing and certification services for independent technology tests. With the latest measurement technology and practical testing methods, the DLG's test engineers carry out testing of both product developments and innovations.

As an EU-notified test laboratory with multiple accreditations, the DLG Test Center Technology and Farm Inputs provides farmers and practitioners with important information and decision-making aids, in the form of its recognised technology tests and DLG tests, to assist in the planning of investments in agricultural technologies and farm inputs.

ENTAM

European Network for Testing of Agricultural Machines is the association of European test centres. ENTAM's objective is the Europe-wide distribution of test results for farmers, agricultural equipment dealers, and producers.

More information about the Network is available at www.entam.com or by writing to ENTAM at the email address: info@entam.com

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