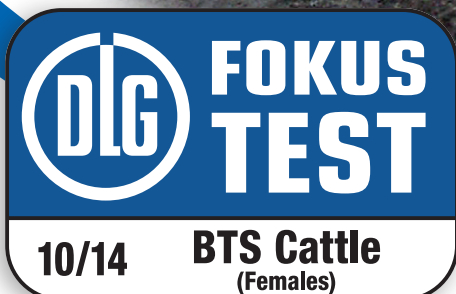


# DLG Test Report 6239 F

Bioret Agri

## Pacific Waterbed

BTS Cattle<sup>1</sup> (Females)



Test Center  
Technology and Farm Inputs

[www.DLG-Test.de](http://www.DLG-Test.de)

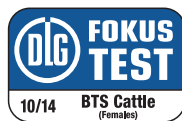
# Overview

---

The FokusTest 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 SignumTest, the DLG's

extensive usability test for technical products, and concludes with the publishing of a test report and the awarding of a test symbol.



The DLG FokusTest "BTS Cattle<sup>1</sup>" included joint inspections and behavioural observations during standing up and lying down in three working farms, as well as measurement of deformability on test rigs at the DLG Test Center Technology and Farm Inputs. Data was acquired and analysed in accordance with the "Require-

ments of the BTS Programme Regarding Deformable Mattresses for Bovine Livestock" (Swiss Ethics Programme Ordinance of 25th June 2008, Annex 3).

Other criteria were not investigated.

## Assessment – Brief Summary

---

The Pacific Waterbed tested here was investigated with regard to comfort characteristics on test rigs in the DLG FokusTest "BTS Cattle<sup>1</sup>". Joint inspections were carried out in three real-life farms, and behavioural observations were made during standing up and lying down.

The requirements of the BTS programme regarding deformable mattresses for bovine livestock (Swiss Ethics Programme Ordinance of 25th June 2008, Annex 3) are met.

---

<sup>1</sup> Swiss support programme for especially animal-friendly housing systems ("Besonders tierfreundliche Stallhaltungssysteme", BTS)

# The Product

## Applicant

Bioret Agri,  
ZI de la Sangle,  
F-44390 Nort Sur Erdre

Product:  
Pacific Waterbed

Contact:  
Tel.: 0033 240 72 1230  
Fax: 0033 240 72 2503  
Email: export@bioret-agri.com  
Internet: www.bioret-agri.com

## Description and Technical Data

The black Pacific Waterbed tested here is an elastic floor covering made of rubber and is intended for use in the resting area of high cubicles in cubicle houses.

Supplied as a roll, this stable floor covering is reinforced with two synthetic fabrics

- top side:  
screen-printing texture
- underside:  
rough, finely structured surface

During the production process, the individual resting area is formed between the two layers of fabric. The resulting space (approx. 100 x 165 cm for the waterbed 120 x 180 cm and 105 x 175 cm for the waterbed 125 x 190 cm) has a filling hole through which the corresponding volume of water is introduced for each resting area. A firm bond is formed around the cavity by a border consisting of styrene-butadiene rubber (SBR)/natural rubber (NR) and the fabric inlays, which are vulcanised together from above and below during the production process.

Table 2:  
Main dimensions and weight

Main dimensions and weight	
Length	Supplied as sheeting
Width	180 and 190 cm
Thickness when filled with water	approx. 50 mm
Thickness when not filled with water	approx. 9 mm
Weight when not filled with water	approx. 10.0 kg/m <sup>2</sup>

A clamp seals the filling hole for the resting area.

Table 1:  
Available cubicle width  
and water fill volume

Cubicle width	Water fill volume
110 cm	approx. 45 litres
112.5 cm	approx. 46 litres
115 cm	approx. 48 litres
117.5 cm	approx. 49 litres
120 cm	approx. 50 litres
122.5 cm	approx. 51 litres
125 cm	approx. 53 litres

# The Method

## Deformability and elasticity

The deformability is measured using ball-indentation tests in new condition and following permanent tread load with a calotte ( $r = 120$  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 rig with a round steel foot 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 cm<sup>2</sup>; 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.

## Animal health

At a minimum of three farms, the tarsi (ankle joints) of all<sup>2</sup> cows held in the relevant cowsheds are examined by an independent specialist with relevant experience, and the animals' behaviour while standing

up and lying down on the floor covering is observed.

Mats of the make to be tested are installed in all cubicles at least three months before examination. The examined cows are held exclusively in the relevant cowshed for at least three months before the examination; i.e. they have no access to grazing.

<sup>2</sup> Exceptions: cows in the first trimester of lactation / non-lactating cows / cows that were held in the relevant cowshed for less than three months prior to examination (e.g. purchased; see 2.4) / cows that often lie in the walkway / cows that are ill or were ill recently (e.g. recumbency after calving) / cows injured due to an accident

# The Test Results in Detail

## Animal health

At three farms, the tarsi (ankle joints) of 108 cows were examined by an independent specialist with relevant experience, and the animals' behaviour while standing up and lying down on the floor covering was observed.

The requirements relating to BTS conformity are met.

## Deformability and elasticity

A penetration depth of 21.9 mm was determined in ball-indentation tests in new condition with a calotte ( $r = 120\text{ mm}$ ) and a penetration force of 2,000 N (corresponding to approx. 200 kg). A bearing pressure of 12.1 N/cm<sup>2</sup> was calculated from this, indicating a relatively small load on the carpal joints when lying down and

standing up. The elasticity was measured following a permanent loading test with a steel foot (contact area 75 cm<sup>2</sup>) with 100,000 alternating loads at 10,000 N. Following the endurance test, the penetration depth of the calotte decreased from 21.9 mm to 18.0 mm. The bearing pressure increased from 12.1 N/cm<sup>2</sup> to 14.7 N/cm<sup>2</sup> (see Figure 2). This corresponds to a decrease in deformability and elasticity.

The requirements relating to BTS conformity are met.

## Permanent tread load

No significant wear was observed on the Pacific Waterbed following permanent tread load with a steel foot (contact area 75 cm<sup>2</sup>) on a test rig with 100,000 alternating loads at 10,000 N (corresponding to approx. 1,000 kg). Permanent deformation was observed.

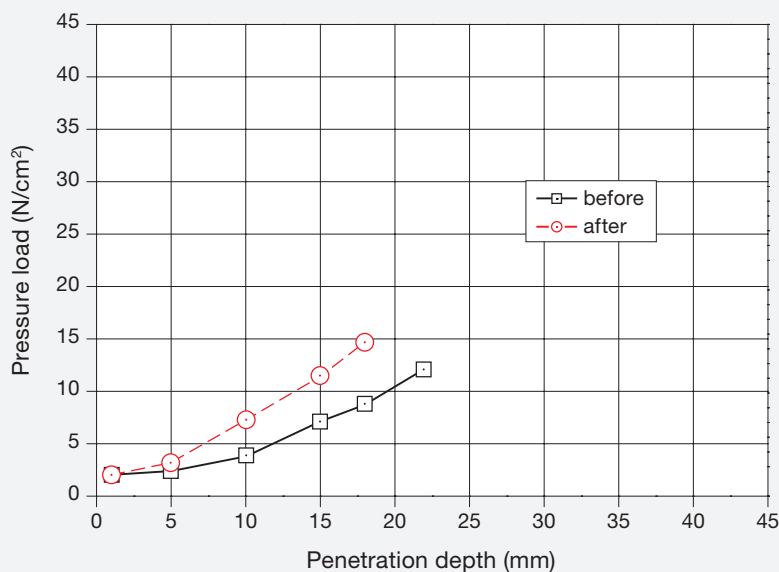


Figure 2:  
Deformability, penetration depth of the calotte ( $r = 120\text{ mm}$ ) as a function of bearing pressure

1 According to the requirements of the Swiss Federal Office for Agriculture, Berne, of March 2004



Table 3:  
Requirements for BTS conformity<sup>1</sup> – test results – evaluation

	Requirement for BTS conformity <sup>2</sup>	Test results	Evaluation
<b>Animal health</b>			
1. Tarsi (ankle joints) with scabs or open wounds as % of examined tarsi	max. 25 %	15.7 %	requirement met
2. Tarsi with larger scabs (> 2 cm) or larger open wounds (> 2 cm) as % of examined tarsi	max. 8 %	0.9 %	requirement met
3. Tarsi with another serious change (e.g. change in size) as % of examined tarsi	max. 1 %	0 %	requirement met
4. Other serious physical harm to the animals that could be caused by the mattress	none	none	requirement met
5. Behavioural abnormalities that could be caused by the mattress	none	none	requirement met
<b>Deformability and elasticity</b>			
6. Penetration depth into the waterbed in new condition	min. 10 mm	21.9 mm	requirement met
7. Penetration depth into the waterbed following permanent tread load	min. 8 mm	18.0 mm	requirement met

## Summary

The tested Pacific Waterbed meets the requirements of the BTS programme regarding deformable mattresses for bovine livestock

(Swiss Ethics Programme Ordinance of 25th June 2008, Annex 3).

<sup>1</sup> According to the requirements of the Swiss Federal Office for Agriculture, Berne, of March 2004

<sup>2</sup> Exceptions: cows in the first trimester of lactation / non-lactating cows / cows that were held in the relevant cowshed for less than three months prior to examination (e.g. purchased; see 2.4) / cows that often lie in the walkway / cows that are ill or were ill recently (e.g. recumbency after calving) / cows injured due to an accident

## Further Information

Further test results for cubicle flooring are available to download at: [www.dlg-test.de/stalleinrichtungen](http://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](http://www.dlg.org/merkblaetter.html)

### Test execution

DLG e.V.,  
Test Center  
Technology and Farm Inputs,  
Max-Eyth-Weg 1,  
64823 Groß-Umstadt

### Test basis

FokusTest "BTS Cattle"<sup>1</sup>  
BTS programme regarding deformable mattresses for bovine livestock (Swiss Ethics Programme Ordinance of 25th June 2008, Annex 3)

### Field

Animal Husbandry Technologies

### Project Manager

Dipl.-Ing. agr. Susanne Gäckler

### Test Engineer(s)

Dr. Harald Reubold<sup>2</sup>

<sup>1</sup> According to the requirements of the Swiss Federal Office for Agriculture, Berne, of March 2004

<sup>2</sup> 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 services and to make these transparent to the public.

Obtain access to knowledge advancement and other advantages, and collaborate on expert knowledge in the agricultural industry! Please visit [http://www.dlg.org/membership\\_agriculture.html](http://www.dlg.org/membership_agriculture.html) for further information.

### 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.

14-489  
© 2014 DLG



DLG e.V.  
Test Center Technology and Farm Inputs  
Max-Eyth-Weg 1, 64823 Groß-Umstadt  
Telephone +49 69 24788-600, Fax +49 69 24788-690  
[tech@DLG.org](mailto:tech@DLG.org) · [www.DLG.org](http://www.DLG.org)

Download all DLG test reports free of charge at: [www.dlg-test.de](http://www.dlg-test.de)!