

**Bioret Agri**

# **Waterbed Bioret Aquastar**

Deformability/Elasticity,  
Permanent Tread Load



**BIORET AGRI  
AQUASTAR WATERBED**

✓ **Deformability/Elasticity**  
✓ **Permanent Tread Load**

DLG Test Report 7497



## Overview

A quality mark “DLG-APPROVED test for single value-determining criteria” is awarded to agricultural products which successfully passed a smaller-scope DLG usability test according to independent and recognized evaluation criteria. The test intends to highlight special innovations and key criteria of the test item. The test can focus on criteria from the DLG testing framework for

full tests or on other individual features or qualitative criteria. The minimum requirements, the test conditions and procedures as well as the evaluation guidelines of the test results are determined in consultation with a DLG expert group. They comply with the generally recognized technology rules as well as with scientific and agricultural knowledge and requirements. The successful test concludes with the publishing of a test report and the awarding of a quality mark which is valid for five years following the award date.

The DLG Approved Test “Deformability/Elasticity, Permanent Tread Load” includes technical measurements 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 of December 2018 and DIN 3763:2022-08 (Elastic floorings for cattle and dairy cows walking and rest surfaces – Requirements and Testing). Other criteria were not investigated.



**BIORET AGRI  
AQUASTAR WATERBED**  
✓ Deformability/Elasticity  
✓ Permanent Tread Load  
DLG Test Report 7497

## Assessment – brief summary

The Bioret Aquastar Waterbed tested here, an elastic floor covering for the resting area in cubicle houses, was investigated with regard to durability and comfort properties on test stands in the DLG APPROVED Test for single-value-determining-criteria. The deformability and elasticity of the waterbed were measured and a permanent tread load was applied.

Requirements of DIN 3763 fulfilled in the examined criteria. Deformability and elasticity class 4 according to DIN 3763.

Table 1:  
Overview of results

DLG QUALITY PROFILE	Evaluation*
Deformability and elasticity in new condition	■ ■ ■ ■ ■ *
Deformability and elasticity following endurance test	■ ■ ■ ■ ■ *
Lasting deformation following endurance test	■ ■ ■ ■ ■ *
Wear following endurance test	■ ■ ■ □ □ *

\* The DLG test framework specifies the following evaluation range:  
■ ■ ■ or better = meets, exceeds or clearly exceeds the specified DLG standard, ■ □ = meets the statutory requirements for marketing the product, □ = failed

## The product

### Manufacturer and Applicant

Bioret Agri,  
Z.I. de la Sangle,  
F-44390 Nort Sur Erdre Frankreich

Product: Aquastar Wasserbett

Contact:  
Fon 0033 240 72-1230  
Fax 0033 240 72-2503  
contact@bioret-agri.com  
www.bioret-agri.com

### Description and Technical Data

The Aquastar Waaterbed tested here is an elastic floor covering for use in the resting area of high cubicles in cubicle houses; it contains waterbed with a latexfoam underlay.

- Surface with groove profil
- Thickness Latexfoam: approx. 30 mm
- Thickness complete: approx. 70 mm
- Shore A hardness: approx. 70
- laid as sheeting



## 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.

## The test results in detail

### Deformability and elasticity

A penetration depth of 29.6 mm was determined in ball-indentation tests in new condition with a calotte ( $r = 120$  mm) and a penetration force of 2,000 N (corresponding to approx. 200 kg). A bearing pressure of 9.0 N/cm<sup>2</sup> was calculated from this, indicat-

ing 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 29.6 mm to 25.6 mm. The bearing pressure increased from 9.0 N/cm<sup>2</sup> to 10.4 N/cm<sup>2</sup> (see Figure 2). This corresponds to a decrease in deformability and elasticity.

### Permanent tread load

No noticeable wear was observed following exposure to permanent tread load on a test stand with 100,000 alternating loads at 10,000 N. Wear on the surface was detected and no lasting deformation was observed.

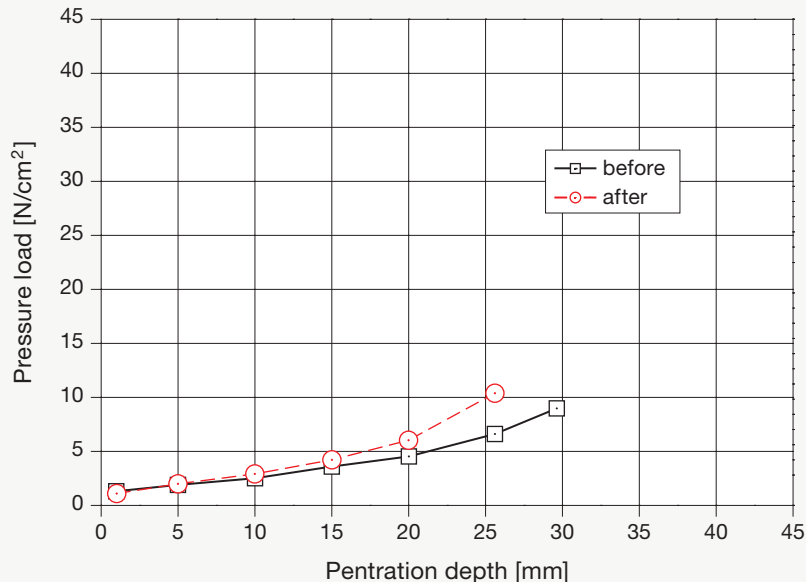


Figure 2: Deformability as a function of bearing pressure

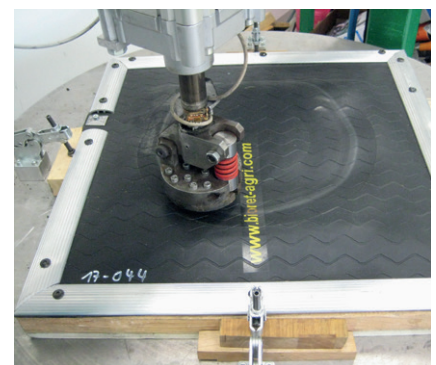


Figure 3: Permanent tread load

## Summary

Based on test-stand investigations, the criteria tested in this DLG-APPROVED-test-for-single-value-determining-criteria evaluate the comfort and durability properties of the Bioret Aquastar Waterbed for use in the resting area of high cubicles in cubicle houses. The tested Bioret Aquastar Waterbed met the requirements of the Testing Framework and DIN 3763 with respect to the investigated criteria.

## Further information

### Testing agency

DLG TestService GmbH,  
Gross-Umstadt location, Germany

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

### DLG test framework

DLG Testing Framework for elastic stable flooring,  
as of December 2018

DIN 3763:2022-08 (Elastic floorings for cattle and  
dairy cows walking and rest surfaces – Requirements  
and Testing)

### Department

Agriculture

### Division head

Dr. Michael Eise

### Test engineer(s)

Dr. Harald Reubold\*

\* Author

## DLG. An 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.

For more than 130 years, our mission has also been to promote dialogue between academia, farmers and

the general public across disciplines and national borders. As an open and independent organisation, our network of experts collaborate with farmers, academics, consultants, policymakers and specialists in administration in the development of future-proof solutions for the challenges facing the agriculture and the food industry.

### Leaders in the testing of agricultural equipment and input products

The DLG Test Center Technology and Farm Inputs and its test methods, test profiles and quality seals hold a leading position in testing and certifying equipment and inputs for the agricultural industry. Our test methods and test profiles are developed by an independent and impartial commission to simulate in-field applications of the products. All tests are carried out using state-of-the-art measuring and test methods applying also international standards.

The Aquastar Waterbed already received the DLG APPROVED Test Mark in 2017.

The results presented in the report are based on DLG test report 6791. According to the applicant, the waterbed is produced unchanged in the tested version.

Internal test code DLG: 2402-0042

Copyright DLG: © 2024 DLG



**DLG TestService GmbH**  
**Standort Groß-Umstadt**

Max-Eyth-Weg 1 • 64823 Groß-Umstadt • Germany  
Phone +49 69 24788-600 • Fax +49 69 24788-690  
Tech@DLG.org • www.DLG.org

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