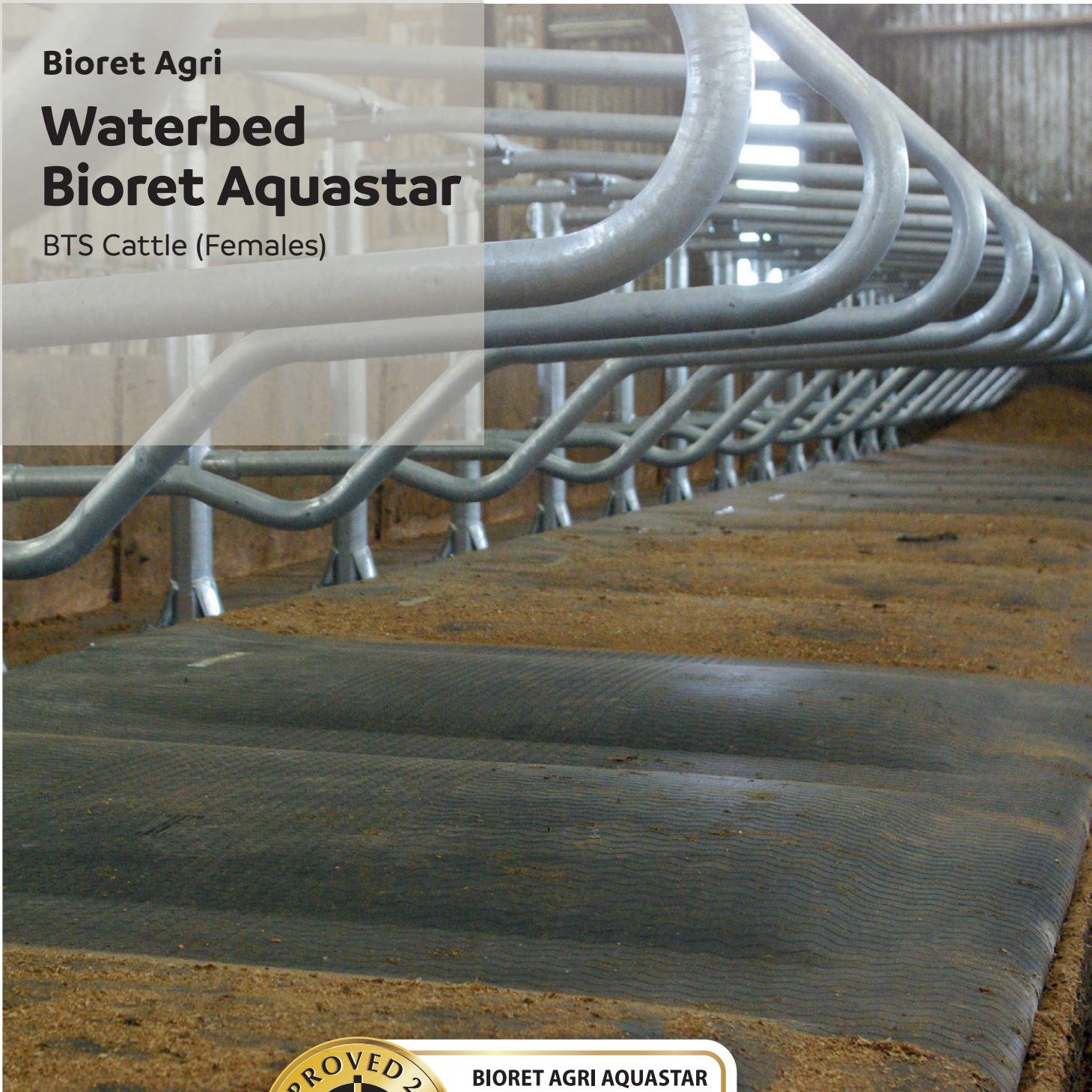


Bioret Agri

Waterbed Bioret Aquastar

BTS Cattle (Females)



BIORET AGRI AQUASTAR

✓ **BTS-Cattle
(Females)**

DLG Test Report 7498

Overview

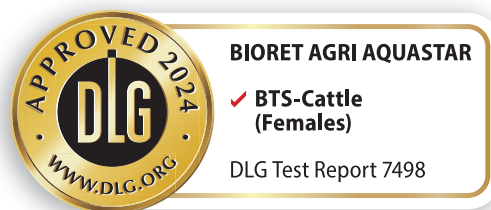
A quality mark “DLG-APPROVED for single value-determining criteria” is awarded to agricultural products which successfully passed a smaller-scope DLG usability test according to independent and recognized evaluation criteria.

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 “BTS Cattle¹” 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 “Requirements of the BTS Programme Regarding Deformable Mattresses for Bovine Livestock” (Swiss Ethics Programme Ordinance of 23th October 2013, Annex 6) and DIN 3763:2022-08 (Elastic floorings for cattle and dairy cows walking and rest surfaces – Requirements and Testing). Other criteria were not investigated.



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 comfort characteristics on test rigs in the DLG Approved Test “BTS Cattle¹”.

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 23th October 2013, Annex 6) are met. Deformation and Elasticity class 4 DIN 3763.

Table 1:
Overview of results

DLG QUALITY PROFILE	Evaluation*
Animal health	✓
Deformation and elasticity	✓

* Evaluation range: requirements fulfilled (✓) / requirements not fulfilled (✗)

¹ Swiss support programme for especially animal-friendly housing systems (“Besonders tierfreundliche Stallhaltungssysteme”, BTS)

The product

Manufacturer

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

Product: Aquastar Waterbed

Contact: Phone 0033 240 72-1230, fax 0033 240 72-2503, contact@bioret-agri.com, www.bioret-agri.com

Description and Technical Data

The Aquastar Waterbed 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 ca. 30 mm
- Thickness complete ca. 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 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.

Animal health

At a minimum of three farms, the tarsi (ankle joints) of all² 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.

² 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 118 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 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/cm² 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 cm²) 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/cm² to 10.4 N/cm² (see Figure 2). This corresponds to a decrease in deformability and elasticity. The requirements relating to BTS conformity are met.

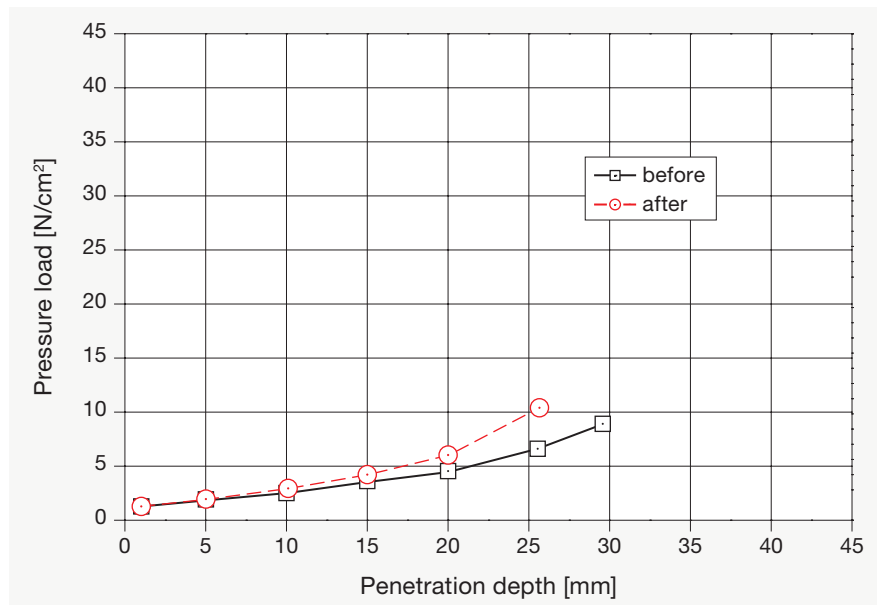


Figure 2:
Deformability, penetration depth of the calotte ($r = 120$ mm)
as function of bearing pressure

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.

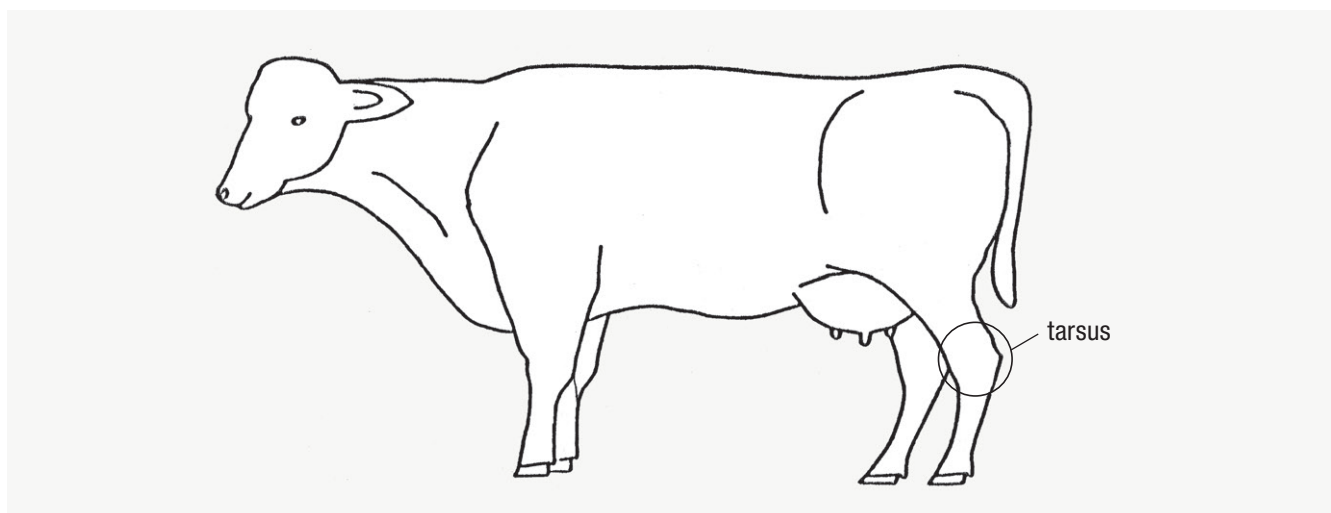


Figure 3:
The shown joint was examined

Table 2:
Requirements for BTS conformity – test results – evaluation

	Requirement for BTS conformity²	Test results	Evaluation
Animal health			
1. Tarsi (ankle joints) with scabs or open wounds as % of examined tarsi	max. 25 %	17.4 %	requirement met
2. Tarsi with larger scabs (> 2 cm) or larger open wounds (> 2 cm) as % of examined tarsi	max. 8 %	1.4 %	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 rubber mat.	none	none	requirement met
5. Behavioural abnormalities that could be caused by the rubber mat.	none	none	requirement met
Deformability and elasticity			
6. Penetration depth into the rubber mat in new condition	min. 10 mm	29.6 mm	requirement met
7. Penetration depth into rubber mat following permanent tread load	min. 8 mm	25.6 mm	requirement met

³ According to the requirements of the Swiss Federal Office for Agriculture, Berne, of March 2004.

Summary

The tested Bioret Aquastar Waterbed meets the requirements of the BTS programme regarding deformable mattresses for bovine livestock (Swiss Ethics Programme Ordinance of 23th October 2013, Annex 6).

Further information

Testing agency

DLG TestService GmbH,
Gross-Umstadt location, Germany

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

DLG test framework

BTS programme regarding deformable mattresses for bovine livestock (Swiss Ethics Programme Ordinance of 23th October 2013, Annex 6)

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 6773. According to the applicant, the waterbed is produced unchanged in the tested version.

Internal test code DLG: 2402-0042

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