DLG Test Report 6912





Overview

The DLG APPROVED FULL TEST quality mark is awarded to agricultural equipment that has passed a comprehensive DLG usability test. A DLG usability test is carried out to independent and recognised test criteria and provides an objective and unbiased assessment of the product and all features considered essential by users. The test comprises individual lab tests as well as field tests in various



conditions; in addition to that the product has to prove itself in on-farm applications. The test conditions and procedures are defined by an independent test commission and described in a test framework which defines the parameters for evaluation. Yet the test conditions and procedures as defined are revised on an ongoing basis so they reflect what is acknowledged as the current state of the art as well as the latest scientific findings and also agricultural insights and requirements. After a product has passed the test, a test report is produced and published and the quality mark is awarded to the product and will retain its validity for five years from the date of award.

This DLG APPROVED FULL TEST consisted of technical measurements, in-situ testing and observation of animal behaviour on livestock farms.

The in-situ measurements included power consumption, wattage and shut-off force. In addition, ease of installation, durability, wear resistance, operational reliability, maintenance and cleaning were assessed and animal behaviour observed. The test was carried out according to the DLG test framework for cow brushes (date of issue March 1999).

Assessment in brief

The DeLaval Swinging Cow Brush SCB tested is a cleaning machine for cattle and cows. Its functionality was tested in situ according to the DLG APPROVED FULL TEST framework. The brush starts off on slight contact and rotates in one direction. Its height from the ground can be conveniently adjusted with a tool to suit the size of the animals.

Table 1:Summary of test results

Parameter tested	Test result	Assesment*
Suitability		
	The brush is suitable for cleaning and grooming cattle and cow skin. To avoid the brush poses a hazard to the animals it is necessary to cut tuft hair to 3 cm.	
Operational reliability		
	Confirmed by DPLF	

TECHNICAL CRITERIA

Installation		
	suitable for self-installation	0
Mains power leads	away from animals	+
Installation and operating instructions	very detailed and easy to understand	+ +
Durability and wear		
Wear	low	+
Durability	good, no damage found	+
Operational reliability		
	good	+
Maintenance		
Service and maintenance	low	+
Changing brush elements	straightforward	+
Cleaning	easy, yet rarely necessary	+
Electricity consumption		+
	low	+
Warranty		
	1 year	

ANIMAL-RELATED CRITERIA

Animal behaviour		
	Animals learn to start the brush quickly and easily.	+
Acceptance	very good	+ +
Injuries	none	0
	Brush is stopped on very little resistance by an overload protection mechanism of the motor.	+ +
Animal cleanliness	good in the defined body parts	+

^{*} Evaluation range: + +/+/O/-/- - (O = standard, n.a. = not evaluated)

The Product

Manufacturer

DeLaval International AB, Gustaf de Lavals väg 15, SE-147 21, Sweden

Applicant

DeLaval Services GmbH, Neu Galliner Ring 6, 19258 Gallin, Germany

The product: Swinging Cow Brush SCB

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Description and specifications

The tested DeLaval Swinging Cow Brush SCB is used for cleaning and grooming cattle and cow skin. The rotating brush is powered by a 230V gear motor and has automatic overload protection. The brush starts to rotate on contact. It swings freely in all directions, smoothly up, over and alongside the animal. The DeLaval Swinging Cow Brush SCB moves in a joint similar to a cardanic joint which allows it to move in three dimen-



Figure 2: DeLaval Swinging Cow Brush SCB complete with bracket

sions. By design and functionality the brush reaches easily tail, head, neck and especially hides and back of the animal. To ensure the brush presents no hazard to the cattle, tuft hair must not be longer than 3 cm. It may be necessary to cut the tuft.

The DeLaval Swinging Cow Brush SCB is comprised of a bracket, a master switch with electric lead, an electronically controlled motor and a brush rotor with yellow plastic bristles. The brush consists of a rotor that is mounted vertically in a bracket and rotated by a 230 V gear motor.

Bracket:

- height approx. 1,200 mm
- width approx. 500 mm
- depth approx. 1000 mm
- weight ca. 70 kg

Brush:

- diameter approx. 500 mm
- length 600 mm

Power input:

- 230 V
- speed 24 rpm
- rated output 0.15 kW

Suitability

Suitability, application and areas of application of the cattle/cow brush were assessed in livestock build-ings.

Operational reliability

The operational reliability of the DeLaval Swinging Cow Brush SCB was tested by the German Test and Certifying Center for Agricultural and Forestry Machinery (DPLF), a notified test institute in accordance with the Equipment Safety Act.

Survey

The test results should be verified by conducting a survey among farmers who were using the same model on their farms.

TECHNICAL CRITERIA

Installation

The ease of installation of the brush was assessed in situ; and the installation and operating instructions were assessed.

Durability, wear, operational reliability and maintenance

Durability, wear, reliability and maintenance of the cattle and cow brush were assessed while the brush was being used by the animals.

Contamination and cleaning

The level of contamination and ease of cleaning of the cattle and cow brush was assessed while the brush was being used by the animals.

Power consumption/wattage

The energy consumption was measured with an wattmeter while the brush was idling and while it was brushing an animal for a continued period of two minutes at least. In addition, the power consumption was recorded over a period of one week at least while the brush was being used by the animals. The number of animals in the group that had access to the brush was also recorded.

Warranty

The manufacturer must state whether a warranty is granted for the product and the warranty period.

ANIMAL-RELATED CRITERIA

Animal behaviour

To assess the suitability of the brush for animal care, the animals were observed while using it. The aim was to find out whether the animals could start the brush easily and whether they accepted it readily.

Injuries

It was assessed whether the brush caused any injuries to the animals as they were using it at two livestock farms (tail injuries, skin abrasions, tags torn from ears).

Also, the amount of force was measured that had to be applied to the brush to stop it by its motor. This shut-off force was measured using a spring balance and an approx. 2cm wide strap that simulated the tail of an animal. The strap was wrapped around the brush and then pulled using the spring balance until the brush came to a stop. The force applied to stop the brush was read on the spring balance.

Animal cleanliness

At the two livestock farms it was tested whether the brush effectively cleaned all animal parts that were accessible by the brush after this was installed at the proper height from the ground.

Suitability

The DeLaval Swinging Cow Brush SCB is suitable for cleaning and grooming cattle and cow skin. The test has shown that the animals can start off the brush on contact. Moving in a cardan joint, the brush moves in three dimensions and gives effective cleaning of hides, tail, back, neck and head. A requirement for safe use is that the tuft hair is not longer than 3 cm as instructed by the manufacturer. It may be necessary to cut the tuft.

Operational reliability

The DeLaval Swinging Cow Brush SCB was tested by the German Test and Certifying Center for Agricultural and Forestry Machinery (DPLF) for its operational reliability on 24 August 2017. The company produced an EC Conformity declaration.

Survey

A user survey was not carried out due to lack of customer addresses. The overall assessment of the two farmers who tested the DeLaval Swinging Cow Brush SCB was good. They would buy the brush again.

TECHNICAL CRITERIA

Installation

The cow brush can be installed by owners with suitable tools. The brush is supplied as an assembly and complete with its bracket which is mounted to a wall or post using a hook that is attached to the brush. This hook can be removed after the installation. The manufacturer supplies a detailed template that helps mount the brush in the barn.

The mains power leads must be routed in a safe place where they are not accessible to the cows.

The installation height from the ground is equal the average withers in the herd (see figure 3 and table). The manufacturer recommends 45 cm above the average withers.

Installation and operating instructions

The installation and operating instructions are very detailed and easy to understand.

Illustrations show how the brush is installed, taken into operation, serviced and maintained. The manual

also gives important information on the hazards and risks of using the brush and on the proper installation height, cable routing and service and maintenance. Explicit note is made that the brush must not be used in herds where skin and tuft hair is longer than 3 cm and where animals wear harnesses.



Centir	Centimetres		nes
X	Y	Х	Y
120	160	47.2	63.0
125	165	49.2	65.0
130	170	51.2	66.9
135	175	53.1	68.9
140	180	55.1	70.9
145	185	57.1	72.8
150	190	59.1	74.8
155	195	61.1	76.8
160	200	63.0	78.7
165	205	65.0	80.7

Figure 3: Determining the installation height



Figure 4: Maximum hair length

Durability and wear

After nearly one year of use in a 70- and 40-head group, only little wear was detected on the brush.

Its durability is good. No damage was found on the brush. Wear was relatively low.

Operational reliability

Reliability is good and the brush has worked without any malfunction up to this date.

Maintenance

Maintenance is low. It merely consists of monthly checks of the brush, the threaded assemblies and the gearbox housing. Replacing the rotor is straightforward.

Contamination and cleaning

The testers observed that hairs collected on the floor under the brush.

The design of the brush usually requires no regular cleaning. The brush itself can be cleaned easily after removing it from the bracket.

Power consumption/wattage

The energy consumption is approx. 0.77 kWh/day in a herd with 70 cows which is relatively low. The input power is approx. 70 W – approx. 180 W at work and approx. 1.3 W at rest. When resistance increases (and the brush is blocked) input power may temporarily peak at 270 W.

Warranty

The manufacturer gives a one-year warranty on the brush.

ANIMAL-RELATED CRITERIA

Animal behaviour

The animals learn quickly and without problems to use the cow brush. The brush starts rotating on demand when an animal pushes it out of its vertical rest position. It stops within 10 seconds after the animal ceases using it, returning into its vertical rest position. It instantly starts again when the cow contacts it again.

The brush was very well accepted by the animals who enjoyed brushing their skin, particularly their heads, necks, backs and the base of the tail.

Injuries

The testers found no tail injuries, skin abrasions, ear injuries due to torn tags or any other kind of injury at the two livestock farms where the brush was tested for one year. The motor stops instantly when the brush meets with excessive resistance (e.g. when wrapping the tail around the brush).

The measurements showed that the cow brush stops at a relative low force of about 230 N. The retention force after shut-off is very small: 120 N.

This means that the risk of injury to cattle and cows is very low. To cut out any risk of injury, the manufacturer recommends trimming tuft hair as specified in the instructions.

Animal cleanliness

Provided the brush is mounted a the proper height from the ground, it provides effective cleaning to all body parts. The animals accepted the brush readily and on their own initiative.

Summary

The DLG APPROVED FULL TEST criteria that were applied in this test assessed the functionality of the DeLaval Swinging Cow Brush SCB for cattle and cows as the brush was used in animal houses.

The result is that the tested DeLaval Swinging Cow Brush SCB meets the requirements as specified in the DLG test framework for the criteria examined. The tested product is identical with the product described in the DLG Test Report 5939 dated July 2010.

More information

Test implementation

DLG TestService GmbH, Gross-Umstadt location

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

DLG test scope

DLG APPROVED FULL TEST on "Cow brushes" (date of issue 03, 1999)

Department

Farm buildings and equipment

Division head

Susanne Gäckler

Test engineer(s)

Dr. Harald Reubold *

DLG Test Commission

Dr. agr. Steffen Pache, Köllitsch Dipl.-Ing. Andreas Pelzer, Bad Sassendorf Alfons Baumeister, Bad Sassendorf Reiner Schmidt, Ronneburg Dipl.-Ing. agr. Klaus-Werner Wolf, Höchst

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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.

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 futureproof 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.

Internal test code DLG: 2017-230 Copyright DLG: © 2019 DLG



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