

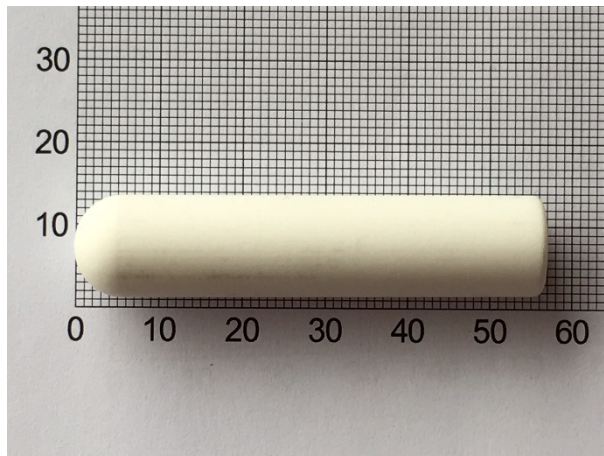


## Test Report

**Conformance Test**  
according to ISO 24631-1  
(Full test procedure)

### I. Application data

Applicant (company name): **Datamars SA**  
Address: **Via ai Prati, CH-6930 Bedano/Lugano,  
Switzerland**  
Transponder type to be tested: **Ruminal bolus**  
Transponder type name: **Bolus 20 g FDX-B**  
Technology: **FDX-B**  
ICAR product code: **981003**



### II. Test execution

Tests conducted by: **DLG Test Center Technology & Farm Inputs,  
Max-Eyth-Weg 1, D-64823 Groß-Umstadt, Germany**  
Test engineer: **Eng. agr. Susanne Gäckler**  
Test period: **2017-02-02 – 2017-02-03**  
Test method: **Conformance test acc. to ISO 24631-1 (2009) in  
consideration of ISO\_DIS 24631-1 (2015)**  
Test equipment: **Arbitrary waveform generator NI PXI 5412,  
Digitizer NI PXI 5122,  
Amplifier he 398 vR1,  
Compensation network he 3986,  
Helmholtz coils acc. to 24631-3 by DLG  
Calibration coil Schwarzbeck FESP 5134-40  
Oscilloscope Tektronix DPO 7254  
Labview software "DLG\_RFID" 1.4.6**

DLG e.V.  
Max-Eyth-Weg 1  
64823 Groß-Umstadt  
Tel. +49 69 24788-600  
Fax +49 69 24788-690  
Tech@DLG.org  
www.DLG.org  
DZ BANK AG  
Frankfurt am Main  
BIC: GENODE55XXX  
IBAN:  
DE84 5006 0000 0000 0338 39  
Commerzbank AG  
Frankfurt am Main  
BIC: DRESDEFFXXX  
IBAN:  
DE31 5008 0000 0093 6522 00  
Helaba Landesbank  
Hessen-Thüringen  
BIC: HELADEFXXX  
IBAN:  
DE58 5005 0000 0021 5150 10  
USt-IdNr.: DE114234905

### III. Test Results

#### 1. Conformance according to ISO\_DIS 24631-1:2015

##### 1.1 Shape and Dimensions

Shape and dimensions of the bolus transponders approximately correspond to the information given in the application form. Average values have been determined by measuring 5 randomly chosen transponders.

Table 1: Dimensions of test samples

	data given by manufacturer	DLG measured data
Length [mm]	56	55.0
Diameter [mm]	11	12.0
Weight [g]	20	20.4
Color	white	white

The boluses did not show visible damages. None of them showed printed test code numbers.

##### 1.2 Resonance frequency

Resonance frequency was measured at a field strength 1 dB below activation threshold in accordance with ISO\_DIS 24631-1 (2015). The returned signal frequencies of the 50 transponders ranged between 134.1 and 136.5 kHz, see *Table 2*.

Arithmetic mean value:  $\bar{x} = 135.1$  kHz

Standard deviation:  $\sigma_x = 0.67$

Variance:  $s^2 = 0.45$

**The required value of  $134.2 \pm 3$  kHz was achieved by all of the transponders.**

The test protocols are enclosed in *Annex 1*.

Table 2: Single results of resonance frequency

DLG-ID	tag no.	Res.freq. (kHz)	DLG-ID	tag no.	Res.freq. (kHz)
1	29	134.4	26	20	136.5
2	04	135.7	27	40	134.9
3	46	136.1	28	49	135.7
4	03	136.1	29	24	134.1
5	17	134.9	30	45	135.7
6	34	135.4	31	35	135.4
7	37	135.1	32	44	135.8
8	43	134.7	33	32	136.1
9	14	134.1	34	06	134.8
10	39	134.4	35	21	134.4
11	47	135.7	36	13	135.0
12	41	134.4	37	28	134.4
13	42	135.5	38	18	134.4
14	38	135.3	39	01	134.2
15	26	134.6	40	11	134.9
16	33	135.7	41	23	135.0
17	48	135.2	42	08	135.6
18	25	135.2	43	12	134.4

19	50	134.4	44	10	135.6
20	22	134.1	45	05	135.1
21	09	135.5	46	02	136.4
22	31	134.5	47	19	136.1
23	27	135.4	48	15	134.1
24	07	134.8	49	16	136.2
25	36	134.8	50	30	134.8

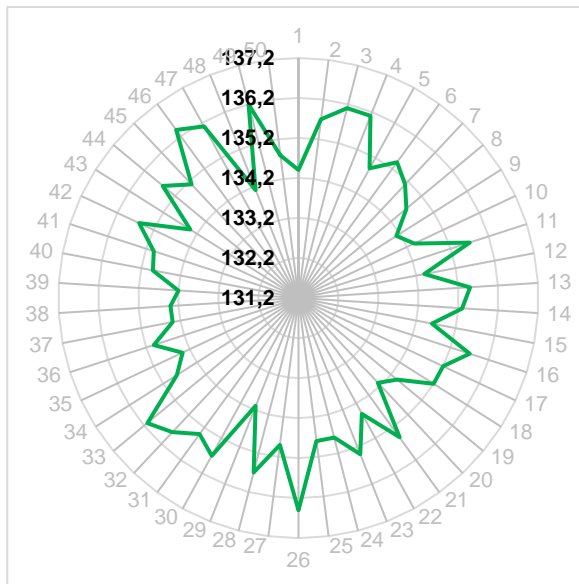


Figure 1: Distribution of measured resonance frequency values<sup>1</sup>

### 1.3 Bit pattern

For all of the transponders the original bit pattern is stated in the printouts of conformance test procedure.

- *Identification codes* match the codes given by the manufacturer (999 000 000 000 001 to 999 000 000 000 050)
- *Country code* is 999 (test code)
- *Data block flag* is a logical "0"
- *Retagging counter* is three logical "0"s
- Logical "0"s in the *user information field*
- Logical "0"s in *reserved field*
- *Animal bit* is a logical "1"
- *CRC* matches the calculated value acc. to ISO 11785:1996, Annex B.

**Therefore all requirements are fulfilled by all of the transponders.**

The test protocols are enclosed in *Annex 2*.

## 2. Comparison of results with original results

Datamars Bolus 20 g FDX-B had been originally measured by JRC TEMPEST Testing Laboratory in 2009, test report JID 1353.

Due to re-certification process the currently measured results are to be compared with the originally measured results.

<sup>1</sup> Within Figure 1 the comma is used as a decimal separator.

## 2.1 Shape and Dimensions

Table 3: Dimensions results 2017 and 2009

	2017, DLG	2009, JRC TEMPEST
No. of samples	5	49
Length [mm]	55.0 ± 0.05	56.7 ± 0.66
Diameter [mm]	12.0 ± 0.06	11.2 ± 0.15
Weight [g]	20.4 ± 0.24	20.4 ± 0.49
Color	white	white

Compared to 2009 length-diameter-ration changed to a very slight extent.

## 2.2 Resonance frequency

Resonance frequency values are shown in a comparative way in Table 4 and Figures 2a and 2b.

Table 4: Resonance frequency results 2017 and 2009

	2017, DLG	2009, JRC TEMPEST
Arithmetic mean value [kHz]	135.1	133.7
Minimum value [kHz]	134.1	131.4
Maximum value [kHz]	136.5	135.7
Standard deviation	0.67	1.05
Variance	0.45	1.11

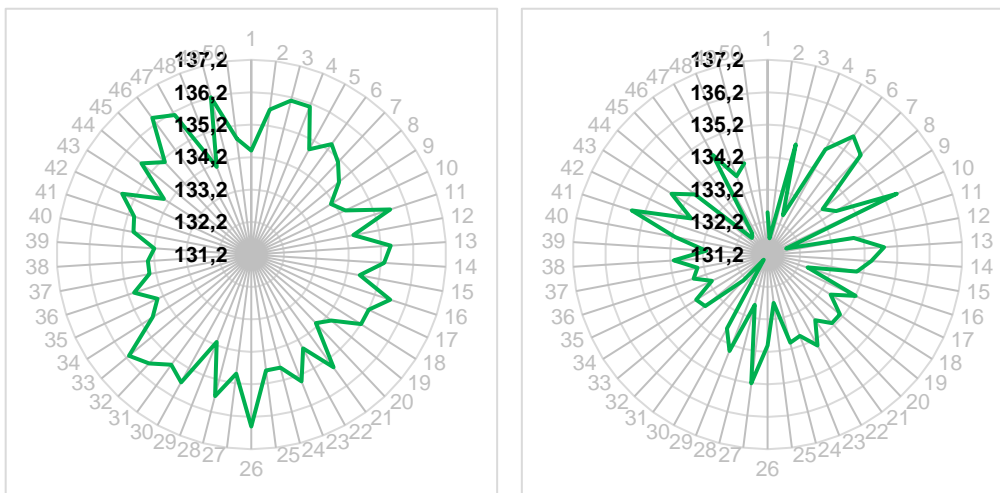


Figure 2 a/b: Distribution of resonance frequency values 2017 (left) and 2009 (right)

Compared to the behaviour 2009 the bolus samples 2017 showed more homogeneous but higher average resonance frequency values.

## IV. Annex

Annex 1: test protocols of resonance frequency test

Annex 2: test protocols of conformance test

No other tests than the described have been done.

Groß-Umstadt, 2017 February 3<sup>rd</sup>

Eng. agr. Susanne Gäckler  
Division Manager and Test Engineer