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**AVEBIOM Spanish Bioenergy Association  
Fray Luis de León 22**

**47002 Valladolid  
SPANIEN**

Title: **Test report to order 11506859**  
Test report: **No. 1013581020**


Project: **No. 1013581**  
Title of project: **AVEBIOM 58**  
Number of samples: **1 sample**  
Sample type: **wood pellets**  
Sampler: **unknown**  
Receipt of samples: **2015-05-29**  
Test period: **2015-05-29 - 2015-06-12**

The test results refer solely to the analysed test specimen. Unless the sampling was done by our laboratory or in our sub-order the responsibility for the correctness of the sampling is disclaimed. This test report is only valid with signature and may only be further published completely and unchanged. Extracts or changes require the authorisation of the EUROFINS UMWELT in each individual case.

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The GTCS are available on <http://www.eurofins.de/umwelt/avb.aspx>.

Accredited test laboratory according to DIN EN ISO/IEC 17025 notification under the DAkkS German Accreditation System for Testing. The accreditation shall apply for the tests listed in the certificate.

Freiberg, 2015-06-12

  
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# Test report to order 11506859

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Project: AVEBIOM 58

Analysis according to EN plus edition January 2012

Parameter	Unit	LOQ	limits			Sample designation	AVEBIOM 58
			EN Plus-A1	EN Plus-A2	EN Plus-B	Lab-ID#	115029118
						Method	

## Quality characteristics

diameter, D (FR-JE02)	mm ar		D06 6±1 D08 8±1	D06 6±1 D08 8±1	D06 6±1 D08 8±1	DIN EN 16127	6,1
length, L (FR-JE02)	mm ar		3,15 ≤ L ≤ 40	3,15 ≤ L ≤ 40	3,15 ≤ L ≤ 40	DIN EN 16127	according
total water, M (FR-JE02)	% w/w ar	0,1	M10 ≤ 10	M10 ≤ 10	M10 ≤ 10	DIN EN 14774-2	7,5
ash content at 550°C, A (FR-JE02)	% w/w db	0,1	A0.7 ≤ 0,7	A1.5 ≤ 1,5	A3.0 ≤ 3,0	DIN EN 14775	0,39
mechanical durability, DU (FR-JE02)	% w/w ar		DU97.5 ≥ 97,5	DU97.5 ≥ 97,5	DU96.5 ≥ 96,5	DIN EN 15210-1	98,7
fine portion for unknown packing, F (FR-JE02)	% w/w ar	0,1	F1,0 < 1,0	F1,0 < 1,0	F1,0 < 1,0	DIN EN 15149-2	0,2
bulk density, BD (FR-JE02)	kg/m³ ar		BD 600 ≥ 600	BD 600 ≥ 600	BD 600 ≥ 600	DIN EN 15103	690
net calorific value (Hu, p), Q (FR-JE02)	MJ/kg ar	0,2	16,5 ≤ Q ≤ 19	16,3 ≤ Q ≤ 19	16,0 ≤ Q ≤ 19	DIN EN 14918	17,77
nitrogen, total, N (FR-JE02)	% w/w db	0,05	N0.3 ≤ 0,3	N0.5 ≤ 0,5	N1.0 ≤ 1,0	DIN EN 15104	< 0,05
sulfur, total, S (FR-JE02)	% w/w db	0,005	S0.03 ≤ 0,03	S0.03 ≤ 0,03	S0.04 ≤ 0,04	DIN EN 15289	0,009
chlorine, total, Cl (FR-JE02)	% w/w db	0,005	Cl0.02 ≤ 0,02	Cl0.02 ≤ 0,02	Cl0.03 ≤ 0,03	DIN EN 15289	< 0,005

## Determination of minor elements from the microwave digestion according to DIN EN 15297

arsenic (FR-JE02)	mg/kg db	0,8	≤ 1	≤ 1	≤ 1	DIN EN ISO 17294-2	< 0,8
lead (FR-JE02)	mg/kg db	2	≤ 10	≤ 10	≤ 10	DIN EN ISO 17294-2	< 2
cadmium (FR-JE02)	mg/kg db	0,2	≤ 0,5	≤ 0,5	≤ 0,5	DIN EN ISO 17294-2	< 0,2
chromium, total (FR-JE02)	mg/kg db	1	≤ 10	≤ 10	≤ 10	DIN EN ISO 17294-2	< 1
copper (FR-JE02)	mg/kg db	1	≤ 10	≤ 10	≤ 10	DIN EN ISO 17294-2	< 1
nickel (FR-JE02)	mg/kg db	1	≤ 10	≤ 10	≤ 10	DIN EN ISO 17294-2	< 1
mercury (FR-JE02)	mg/kg db	0,05	≤ 0,1	≤ 0,1	≤ 0,1	DIN EN 1483	< 0,05
zinc (FR-JE02)	mg/kg db	1	≤ 100	≤ 100	≤ 100	DIN EN ISO 17294-2	12

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					Method		

## Ash melting behaviour (oxidizing atmosphere) on ash 815°C

shrinkage start temperature, SST (FR-JE02)	°C		can be given	can be given	can be given	analogue DIN CEN/TS 15370-1	1090
deformation temperature, DT (FR-JE02)	°C		≥ 1200	≥ 1100	≥ 1100	analogue DIN CEN/TS 15370-1	1340
hemisphere temperature, HT (FR-JE02)	°C		can be given	can be given	can be given	analogue DIN CEN/TS 15370-1	1430*
flow temperature, FT (FR-JE02)	°C		can be given	can be given	can be given	analogue DIN CEN/TS 15370-1	1460

### Annotation:

additive: limits: ≤ 2 % w/w (sort and amount must be specified)

Information given by the customer: no information

length: up to 1 % of pellets can be longer than 40mm. Maximum length should be <45mm.

Hu,p: net calorific value at constant pressure

ar: as received

db: dry basis

\*: no definite hemisphere (hill-like form)

EUROFINS UMWELT is not liable for accuracy of the cited limits.

### Explanations on Locations and Accreditations

The parameters identified by FR have been performed by the laboratory EUROFINS Umwelt Ost GmbH (Bobritzsch-Hilbersdorf).

The accreditation code JE02 identifies the parameters accredited according to DIN EN ISO/IEC 17025:2005 D-PL-14081-01-00.