

Eurofins Umwelt Ost GmbH - Lindenstraße 11
Gewerbegebiet Freiberg Ost - D-09627 - Bobritzsch-Hilbersdorf

**DIN CERTCO Gesellschaft
für Konformitätsbewertung mbH
Alboinstraße 56
12103 Berlin**

Title : **Test report for order 11836066**
Test report number : **AR-19-FR-001041-01**
Project name : **Verfahrensnummer: 3273096, Bestellnummer 1159226**
Number of samples : **2**
Sample type : **wood pellets**
Date of sample taking : **2018-12-14**
Sample Taker: **Client**
Sample reception date : **2018-12-20**
Sample processing time : **2018-12-27 - 2019-01-14**

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.

Our General Terms & Conditions of Sale (GTCS) are applicable, as far as no specific agreements do exist. The GTCS are available on <http://www.eurofins.de/umwelt/avb.aspx>.

Accredited test laboratory according to DIN EN ISO/IEC 17025:2005 notification under the DAkkS German Accreditation System for Testing. The laboratory is according (D-PL-14081-01-00) accredited.

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Digitally signed 15.01.2019
Dr. Ulrich Erler
Prüfleitung



Parameter	Lab	Accr.	Method	Limit values		Description		EKOPELLET Arregi, MV-1-FINES		EKOPELLET Arregi, MV-2-DIN+	
				DIN plus ar	DIN plus db	Date and time of sample taking		2018-12-14		2018-12-14	
				LOQ	Unit	Sample number		118144044		118144045	
								ar	db	ar	db

Quality characteristics

Length	FR	JE02	DIN EN ISO 17829: 2016-03	2)				-	-	according	-
Diameter	FR	JE02	DIN EN ISO 17829: 2016-03	3)			mm	-	-	6.1	-
Moisture	FR	JE02	DIN EN ISO 18134-2: 2017-05	10		0.1	% (w/w)	-	-	5.5	-
Ash content (550°C)	FR	JE02	DIN EN ISO 18122: 2016-03		0.7	0.1	% (w/w)	-	-	0.4	0.4
Durability	FR	JE02	DIN EN ISO 17831-1: 2016-05	≥ 97.5			% (w/w)	-	-	98.4	-
Fine portion < 3,15 mm	FR	JE02	DIN EN ISO 18846: 2016-12	0.5 ¹⁾		0.1	% (w/w)	0.4	-	0.5	-
Bulk density	FR	JE02	DIN EN ISO 17828: 2016-05	≥ 600 ⁴⁾			kg/m ³	-	-	670	-
Gross calorific value (qV,gr)	FR	JE02	DIN EN ISO 18125: 2017-08			200	kJ/kg	-	-	19400	20600
Net calorific value (qp,net)	FR	JE02	berechnet nach DIN EN ISO 18125: 2017-08	> 4.6 ⁵⁾		0.06	kWh/kg	-	-	5.00	5.33
Carbon	FR	JE02	DIN EN ISO 16948: 2015-09			0.2	% (w/w)	-	-	47.7	50.5
Nitrogen	FR	JE02	DIN EN ISO 16948: 2015-09		0.3	0.05	% (w/w)	-	-	< 0.05	< 0.05
Hydrogen	FR	JE02	DIN EN ISO 16948: 2015-09			0.1	% (w/w)	-	-	6.0	6.3
Oxygen	FR	JE02	DIN EN ISO 16993: 2016-11				% (w/w)	-	-	40.3	42.7
Sulphur	FR	JE02	DIN EN ISO 16994: 2016-12		0.04	0.005	% (w/w)	-	-	0.010	0.010
Chlorine	FR	JE02	DIN EN ISO 16994: 2016-12		0.02	0.005	% (w/w)	-	-	0.012	0.013

Parameter	Lab	Accr.	Method	Limit values		Sample number		EKOPELLET Arregi, MV-1-FINES		EKOPELLET Arregi, MV-2-DIN+	
				DIN plus ar	DIN plus db	LOQ	Unit	ar	db	ar	db
				Description		EKOPELLET Arregi, MV-1-FINES		EKOPELLET Arregi, MV-2-DIN+			
				Date and time of sample taking		2018-12-14		2018-12-14			
				Sample number		118144044		118144045			

Minor elements acc. DIN EN ISO 16968

Arsenic (As)	FR	JE02	DIN EN ISO 17294-2: 2017-01		1	0.8	mg/kg	-	-	-	< 0.8
Lead (Pb)	FR	JE02	DIN EN ISO 17294-2: 2017-01		10	2	mg/kg	-	-	-	< 2
Cadmium (Cd)	FR	JE02	DIN EN ISO 17294-2: 2017-01		0.5	0.2	mg/kg	-	-	-	< 0.2
Chromium (Cr)	FR	JE02	DIN EN ISO 17294-2: 2017-01		10	1	mg/kg	-	-	-	1
Copper (Cu)	FR	JE02	DIN EN ISO 17294-2: 2017-01		10	1	mg/kg	-	-	-	1
Nickel (Ni)	FR	JE02	DIN EN ISO 17294-2: 2017-01		10	1	mg/kg	-	-	-	< 1
Mercury (Hg)	FR	JE02	DIN EN ISO 12846: 2012-08		0.1	0.05	mg/kg	-	-	-	< 0.05
Zinc (Zn)	FR	JE02	DIN EN ISO 17294-2: 2017-01		100	1	mg/kg	-	-	-	15

Ash melting behaviour (ox. atmo.) 815°C

Shrinkage start temp SST	FR	JE02	CEN/TS 15370-1: 2006-12		6)		°C	-	-	-	1010
Deformation temp DT	FR	JE02	CEN/TS 15370-1: 2006-12		≥ 1200 ⁶⁾		°C	-	-	-	1470
Hemisphere temp HT	FR	JE02	CEN/TS 15370-1: 2006-12		6)		°C	-	-	-	> 1490
Flow temp FT	FR	JE02	CEN/TS 15370-1: 2006-12		6)		°C	-	-	-	> 1490

Explanations

LOQ - Limit of quantification

ar - as received

db - dry basis

Lab - Abbreviation of the performing laboratory

Accr. - Abbreviation of the accreditation of the performing laboratory

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 .

Explanations regarding Limits

Analysis performed according to DIN plus (wood pellets) - edition June 2015.

- 1) small packages up to 20 kg; large packages and bulk material: $\leq 1,0$
- 2) 3,15 - 40 mm; up to 1 % of pellets can be longer than 40mm. Maximum length should be <45mm.
- 3) D06 or D08 pellets +/- 1mm
- 4) Maximum for bulk density is 750 kg/m³.
- 5) qp,net: net calorific value at constant pressure
- 6) should be given

EUROFINS UMWELT assumes no responsibility for the legal liability of the cited limits.