

Test Report No.: 408.779

Date: 2012-10-24

Determination of fuel parameters of pellets sample according to DINplus

Client: DIN CERTCO
Gesellschaft für Konformitätsbewertung mbH
Attn. Mr. Marcus Blachnik
Alboinstraße 56
12103 Berlin
Deutschland

Test item(s): 1 sample of 6 mm Pellets (EBPELLET S.L.Spain.; processing number: 12-2317)

Task: Determination of fuel parameter of pellets sample according to DINplus

Order: Order of 12.09.2012

Date of sampling: —

Location of sampling: No samples taken by *ofi* staff
Samples provided by *ofi*'s client

Receipt of samples: 04.10.2012

Ref: Eng/Woj

1 SCOPE OF WORK

According to the order, the following specified fuel parameters were to be determined for the solid biofuel samples delivered by the client:

- Determination of water content
- Determination of ash content
- Determination of density
- Determination of bulk density
- Determination of the mechanical durability
- Determination of the content of fines
- Determination of the calorific value including elemental analysis
- Determination of chlorine and sulfur content
- Determination of the heavy metal content (qualitative)
- Determination of ash melting behaviour

2 SCOPE OF APPLICATION

The results given in this test report have been obtained under the specific conditions of the individual tests. As a rule they are not the only criteria for assessing the product in question and its suitability for a specific purpose of application.

3 SAMPLE MATERIAL

Our client submitted the following samples for the purpose of testing:

- 1 sample Pellets, bag with approx. 15 kg; (EBEPEL LET S.L...; processing number: 12-2317) internal sample number: 408.779 -1
- 1 sample Pellets, bag with approx. 4 kg; (EBEPEL LET S.L...; processing number: 12-2317) internal sample number: 408.779 -2

Other documents submitted by our client:

No (other) documents were submitted

4 SAMPLE PREPARATION

There were no special sample preparation steps needed.

5 TESTS

Testing took place in October 2012. The tests were carried out in the individual technical departments within the scope of competence of the authorised signatories according to the ofi QM manual. The tests were carried out in cooperation with Eurofins Umwelt Ost GmbH (heavy metals).

5.1 Testmethods

Parameter	Operating procedure	Test conditions	Test apparatus (ofi – equipment #)
Moisture content	EN 14774-2	drying temperature: 105°C	Analytical balance, # 2200 Drying oven, # 2186
Ash content	EN 14775	ashing temperature: 550°C	Analytical balance, # 2200 Muffle furnace, # 2187
Density	DIN 52182		Calliper rule, # 1988, Analytical balance, # 2200
bulk density	EN 15103		5l Bulk density container, # 2864
Mechanical durability	EN 15210-1		ASAE-Tumbler # 2788
Calorific value	EN 14918.		Analytical balance, # 2200 Bomb calorimeter IKA C 5000, # 1715
CHN	EN 15104		Elementar-analyzer LECO, # 2838
Sulphur- and Chlorine content	EN 15289		Bomb: IKA C 5000, # 1715; ion chromatography (DI- ONEX ICS-2100 System), # 2851
heavy metals	EN 15297		Eurofins Umwelt GmbH
Ash melting behaviour	CEN/TS 15370-1		Heating microscope; LECO AF700 # 2927

6 RESULTS

The results of the analysis are compiled in table 1.

Table 1: Results for the determination of fuel parameter

		Pellets	Limit values according to DINplus
Internal sample number		408.779	-
moisture content	[%]	6,77	≤ 10
ash content (db) 550°C	[%]	0,33	≤ 0,7
density	[kg/dm ³]	1,25	≥ 1,12
length	[mm]	19,7	3,15 ≤ L ≤ 40
diameter	[mm]	6,18	6 ± 1
bulk density	[kg/dm ³]	683	≥ 600
mechanical durability	[%]	98,6	≥ 97,5
content of fines (packages)	[%]	0,46	≤ 0,5 ¹⁾
net calorific value (db)	[MJ/kg]	19,1	-
net calorific value (ar)	[MJ/kg]	17,6	16,5 ≤ Hu ≤ 19
Nitrogen content (db)	[%]	0,05	≤ 0,3
Carbon content (db)	[%]	51,2	-
Hydrogen content (db)	[%]	6,24	-
Sulphur content (db)	[%]	0,009	≤ 0,03
Chlorine content (db)	[%]	0,004	≤ 0,02
Arsenic (db)	[mg/kg]	< 0,8	≤ 1
Cadmium (db)	[mg/kg]	< 0,2	≤ 0,5
Chromium (db)	[mg/kg]	< 1	≤ 10
Copper (db)	[mg/kg]	< 1	≤ 10
Lead (db)	[mg/kg]	< 2	≤ 10
Mercury (db)	[mg/kg]	< 0,07	≤ 0,1
Nickel (db)	[mg/kg]	< 1	≤ 10
Zinc (db)	[mg/kg]	5	≤ 100
shrinking temperature SST	[°C]	930	-
deformation temperature DT	[°C]	1060	-
hemisphere temperature HT	[°C]	1480	-
flow temperature FT	[°C]	>1500	-

1) . Limit applies to "small packages" up to 20kg. Here was a 15 kg packages of pellets tested


Notes: Within the 2 sample bags, pellets with an length of >4,5 cm were found

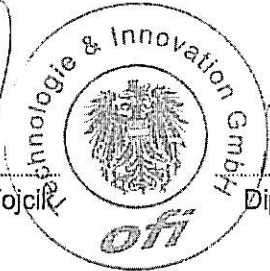
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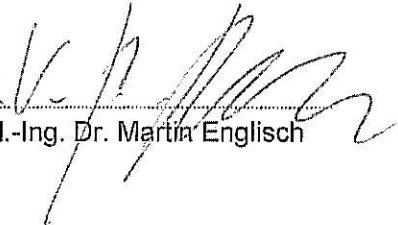
comprises 5 sheets with 1 table(s), 0 figure(s), 0 appendix(es).

Testing staff

Director in charge
Department Eco-Engineering


Dipl. Ing. (FH) Magdalena Wojcik




Dipl.-Ing. Dr. Martin Englisch

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