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Title: **Test report to order 11730514**  
Test report: **No. 1009806209**

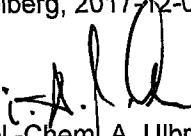
Project: **No. 1009806**  
Title of project: **analysis of wooden pellets, PT11N**  
Number of samples: **1 sample**  
Sample type: **wood pellets**  
Sampling period: **2017-11-21**  
Sampler: **client**  
Receipt of samples: **2017-11-23**  
Test period: **2017-11-23 - 2017-12-01**

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, 2017-12-01

  
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# Test report to order 11730514

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Project: analysis of wooden pellets, PT11N

Analysis according to EN plus edition august 2015

						Sample designation	PT11N
						Sampling date	2017-11-21
						Lab-ID#	117111138
Parameter	Unit	LOQ	limits			Method	
			EN Plus-A1	EN Plus-A2	EN Plus-B		

## Quality characteristics

Parameter	Unit	LOQ	EN Plus-A1	EN Plus-A2	EN Plus-B	Method	Value
diameter, D	mm ar		6±1 or 8±1	6±1 or 8±1	6±1 or 8±1	DIN EN ISO 17829 (FR-JE02)	6,0
length, L	mm ar		3,15 ≤ L ≤ 40	3,15 ≤ L ≤ 40	3,15 ≤ L ≤ 40	DIN EN ISO 17829 (FR-JE02)	according
water content, M	% w/w ar	0,1	≤ 10	≤ 10	≤ 10	DIN EN ISO 18134-2 (FR-JE02)	5,7
ash content, A (550°C)	% w/w db	0,1	≤ 0,7	≤ 1,2	≤ 2,0	DIN EN ISO 18122 (FR-JE02)	0,46
mechanical durability, DU	% w/w ar		≥ 98,0	≥ 97,5	≥ 97,5	DIN EN ISO 17831-1 (FR-JE02)	98,2
fine portion, F (< 3,15 mm)	% w/w ar	0,1	≤ 1,0 <sup>1</sup> or ≤ 0,5 <sup>2</sup>	≤ 1,0 <sup>1</sup> or ≤ 0,5 <sup>2</sup>	≤ 1,0 <sup>1</sup> or ≤ 0,5 <sup>2</sup>	DIN EN ISO 18846 (FR-JE02)	0,3
bulk density, BD	kg/m³ ar		600 ≤ BD ≤ 750	600 ≤ BD ≤ 750	600 ≤ BD ≤ 750	DIN EN ISO 17828 (FR-JE02)	720
net calorific value, Q (H u,p)	MJ/kg ar	0,2	≥ 16,5	≥ 16,5	≥ 16,5	DIN EN ISO 18125 (FR-JE02)	17,89
nitrogen total, N	% w/w db	0,05	≤ 0,3	≤ 0,5	≤ 1,0	DIN EN ISO 16948 (FR-JE02)	< 0,05
sulfur total, S	% w/w db	0,005	≤ 0,04	≤ 0,05	≤ 0,05	DIN EN ISO 16994 (FR-JE02)	0,008
chlorine total, Cl	% w/w db	0,005	≤ 0,02	≤ 0,02	≤ 0,03	DIN EN ISO 16994 (FR-JE02)	0,007

## Determination of minor elements

Element	Unit	LOQ	EN Plus-A1	EN Plus-A2	EN Plus-B	Method	Value
arsenic, As	mg/kg db	0,8	≤ 1	≤ 1	≤ 1	DIN EN ISO 16968 (FR-JE02)	< 0,8
lead, Pb	mg/kg db	2	≤ 10	≤ 10	≤ 10	DIN EN ISO 16968 (FR-JE02)	< 2
cadmium, Cd	mg/kg db	0,2	≤ 0,5	≤ 0,5	≤ 0,5	DIN EN ISO 16968 (FR-JE02)	< 0,2
chromium total, Cr	mg/kg db	1	≤ 10	≤ 10	≤ 10	DIN EN ISO 16968 (FR-JE02)	3
copper, Cu	mg/kg db	1	≤ 10	≤ 10	≤ 10	DIN EN ISO 16968 (FR-JE02)	< 1
nickel, Ni	mg/kg db	1	≤ 10	≤ 10	≤ 10	DIN EN ISO 16968 (FR-JE02)	2
mercury, Hg	mg/kg db	0,07	≤ 0,1	≤ 0,1	≤ 0,1	DIN EN ISO 16968 (FR-JE02)	< 0,05
zinc, Zn	mg/kg db	1	≤ 100	≤ 100	≤ 100	DIN EN ISO 16968 (FR-JE02)	12

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Project: analysis of wooden pellets, PT11N

Analysis according to EN plus edition august 2015

Parameter	Unit	LOQ	limits			Sample designation	PT11N
			EN Plus-A1	EN Plus-A2	EN Plus-B	Sampling date	2017-11-21
						Lab-ID#	117111138
						Method	

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

Parameter	Unit	LOQ	EN Plus-A1	EN Plus-A2	EN Plus-B	Method	Value
shrinkage start temperature, SST	°C		can be given	can be given	can be given	DIN CEN/TS 15370-1 (FR-JE02)	1090
deformation temperature, DT	°C		≥ 1200	≥ 1100	≥ 1100	DIN CEN/TS 15370-1 (FR-JE02)	1430
hemisphere temperature, HT	°C		can be given	can be given	can be given	DIN CEN/TS 15370-1 (FR-JE02)	1450*
flow temperature, FT	°C		can be given	can be given	can be given	DIN CEN/TS 15370-1 (FR-JE02)	1460

comment:

additive: (limits: ≤ 1,8 % w/w during production + 0,2 % w/w after production - 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 for pellets is 45mm.

fine portion: 1) at the end of production or by loading vehicles for delivery to the customer  
2) for filling in pellet bags or big bags

mechanical durability: by loading for transport (vehicle, ship) after production

Hu,p: net calorific value at constant pressure

ar: as received

db: dry basis

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

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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.