



Institut für Umweltschutz und Qualitätssicherung Dr. Krengel GmbH

Analysis Report - No. 24-09989/31608

Customer : DQS Polska Sp. z o.o.
ul. Domaniewska 45
02-672 Warszawa

Order : Testing of wood pellets for selected parameters in accordance with
ENplus. Contract no. 01/10/2024/LAB, offer 1/206/MKr/0624, order dated
03.12.2024

Sample name : Pellet sample 00481
6mm-10kg/BARLINEK_PL/3.12.2024

Sampling : by customer

Sampling date : 2024-12-03

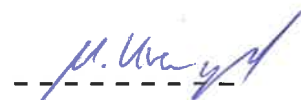
Sample receipt : 2024-12-17

Processing time : 2024-12-17 - 2025-01-10

Laboratory No. : 24-09989

Analysis method : see following page(s)

Grevesmühlen, Jan 10, 2025


M. Krengel

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The test results relate exclusively to the test items available. If the sampling is not carried out by employees of the company IUQ, we assume no responsibility for its correctness. The report may not be reproduced in extracts without the written permission of the testing laboratory. Unless otherwise specified, the parameter-specific analytical measurement uncertainties of the standardized procedures are adhered to and are available on request. With regard to measurement uncertainty, the minimum performance criteria of the methods used are generally based on the European Commission's Directive 2009/90/EC. Outsourcing in accredited laboratories is marked with an F. Non-accredited test methods are marked with NA.

Sample name Pellet sample 00481
6mm-10kg/BARLINEK_PL/3.12.2024
Laboratory No. 24-09989

Parameter	Analysis Method	Unit	Result	Requirements according to ENplus (issue: 01/23)		
				A1	A2	B
Diameter (D)	DIN EN ISO 17829: 2016-03	mm	6.1	6 (±1) or 8 (±1)		
Length (L)	DIN EN ISO 17829: 2016-03	mm	14.9	3,15 ≤ L ≤ 40 ¹⁾		
Share of pellets with a length < 10 mm	DIN EN ISO 17829 / Handbuch ENplus ST1001 Leitfaden: 2016-03 / 2022	Ma-%, ar	31.0	informative		
Coarse fines (3.15 mm ≤ FP < 5.6 mm) category	DIN EN ISO 17829 / Handbuch ENplus ST1001 Leitfaden: 2016-03 / 2022	none	S	informative		
Total moisture (M)	DIN EN ISO 18134-2: 2017-05	Ma-%, ar	5.4	≤ 10,0		
Ash Content (A) (550 ° C)	DIN EN ISO 18122: 2016-03	Ma-% wf	0.43	≤ 0,70	≤ 1,20	≤ 2,00
Ash Content (A) (815 ° C)*	DIN EN ISO 18122: 2016-03	Ma-% wf	0.32	./.		
Mechanical Durability (DU)	DIN EN ISO 17831-1: 2016-05	Ma-%, ar	99.1	≥ 98,0 ²⁾	≥ 97,5 ²⁾	
Fines (<3.15 mm)	DIN EN ISO 18846: 2016-12	Ma-%, ar	< 0.20	≤ 1,0 ³⁾ (≤ 0,5 ⁴⁾)		
Coarse fines (3.15 mm ≤ FP < 5.6 mm)	DIN EN ISO 18846: 2016-12	Ma-%, ar	0.47	informative		
Net Calorific Value at constant volume (qv, net, m)	DIN EN ISO 18125: 2017-08	MJ/kg, ar	18.7	≥ 16,5		
Net Calorific Value at constant volume (qv, net, m)	DIN EN ISO 18125: 2017-08	kWh/kg, ar	5.20	≥ 4,6		
Bulk Density (BD)	DIN EN ISO 17828: 2016-05	kg/m³	660	600 ≤ bulk density ≤ 750		
Particle density	DIN EN ISO 18847: 2016-12	g/cm³	1.29	informative		
Nitrogen (N)	DIN EN ISO 16948: 2015-09	Ma% TM	0.16	≤ 0,3	≤ 0,5	≤ 1,0
Sulfur (S)	DIN EN ISO 16994: 2016-12	Ma% TM	0.011	≤ 0,04	≤ 0,05	
Chlorine (Cl)	DIN EN ISO 16994: 2016-12	Ma% TM	0.006	≤ 0,02		≤0,03
Arsenic (As)	DIN EN ISO 16968: 2015-09	mg/kg TM	0.86	≤ 1		
Cadmium (Cd)	DIN EN ISO 16968: 2015-09	mg/kg TM	< 0.10	≤ 0,5		
Chromium (Cr)	DIN EN ISO 16968: 2015-09	mg/kg TM	< 0.40	≤ 10		
Copper (Cu)	DIN EN ISO 16968: 2015-09	mg/kg TM	3.67	≤ 10		
Lead (Pb)	DIN EN ISO 16968: 2015-09	mg/kg TM	1.59	≤ 10		
Mercury (Hg)	DIN EN ISO 16968: 2015-09	mg/kg TM	< 0.05	≤ 0,1		
Nickel (Ni)	DIN EN ISO 16968: 2015-09	mg/kg TM	< 0.50	≤ 10		
Zinc (Zn)	DIN EN ISO 16968: 2015-09	mg/kg TM	21.1	≤ 100		
Ash Melting Behaviour Oxidating Atmosphere Ash 815 °C						
Starting Temperature During Shrinkage	DIN EN ISO 21404: 2020-06	°C	1030	informative		
Deformation Temperature (DT)	DIN EN ISO 21404: 2020-06	°C	1360	≥ 1.200	≥ 1.100	
Hemisphere Temperature (HT)*	DIN EN ISO 21404: 2020-06	°C	> 1400	informative		
Fluid Temperature (FT)*	DIN EN ISO 21404: 2020-06	°C	> 1400	informative		

1) A maximum of 1% of the pellets may be between 40 and 45 mm long. No pellet may be longer than 45 mm.

2) When loading the vehicle (vehicle, ship) at the production plant.

3) At the factory gate or when loading vehicles for delivery to end customers.

4) When filling pellet bags or sealed big bags.

* No mandatory specification according to ENplus manual

TM - dry mass ar - as received wf - water free state