TEST REPORT
BEA260679-2

Institut für Bioenergie

Date of report:	2026-08-26
Client:	Sparrow d.o.o.
Address:	Marina Marinovica 1, 37260 Varvarin, SERBIA
Order:	Fuel testing according EN*plus*® certification program of wood pellets EN*plus*® ST.1001:2022
Order date:	2026-06-18
Receipt of samples:	2026-07-13; 2026-08-25
Sample(s):	Wood pellets; "RS 007"
Testing period:	2026-07-13 – 2026-08-26
Sample details:	15 kg pellets in bag class A1 from bagging line; internal sample no.: BEA260679-1 and 15 kg pellets resample bag class A1 received on 2026-08-25; internal sample no.: BEA260679-3

BEA260679			**-1**	
parameter EN*plus* ®	limit values A1	limit values A2	**class A1**	unit
diameter	6 ± 1, 8 ± 1	6 ± 1, 8 ± 1	**6,1**	mm (ar)
length (3,15 ≤ L ≤ 40 mm)	(3,15 ≤ L ≤ 40)	(3,15 ≤ L ≤ 40)	**20,3 ± 7,2**	mm (ar)
length (40 < L ≤ 45 mm)**	≤ 1	≤ 1	**0,1**	% in mass (ar)
length (> 45 mm)**	0	0	**0**	piece(s)
share of pellets with a length < 10mm	-	-	**2,2**	% in mass (ar)
category L < 20%, 20%≤ M ≤ 30%, S > 30%	-	-	**L**	-
amount of pellets for length determination	≥ 100	≥ 100	**920**	piece(s)
moisture content	≤ 10,0	≤ 10,0	**5,6**	% in mass (ar)
ash content	≤ 0,70	≤ 1,20	**0,62**	% in mass (db)
mechanical durability	≥ 98,0	≥ 97,5	**98,9**	% in mass (ar)
bulk density	600 ≤ BD ≤ 750	600 ≤ BD ≤ 750	**670**	kg/m³ (ar)
particle density	-	-	**1,32**	g/cm³ (ar)
coarse fines (3,15 ≤ CPF < 5,6 mm)	-	-	**0,1**	% in mass (ar)
fines content (< 3,15 mm), bulk	≤ 1	≤ 1	**-**	% in mass (ar)
fines content (< 3,15 mm), bags	≤ 0,5	≤ 0,5	**0,1**	% in mass (ar)
net calorific value $q_{P,net}$	≥ 16,5	≥ 16,5	**17,2**	MJ/kg (ar)
net calorific value $q_{P,net}$	≥ 4,6	≥ 4,6	**4,8**	kWh/kg (ar)
net calorific value $q_{P,net}$	-	-	**18,4**	MJ/kg (db)
net calorific value $q_{P,net}$	-	-	**5,1**	kWh/kg (db)
gross calorific value $q_{V,gr}$	-	-	**18,6**	MJ/kg (ar)
gross calorific value $q_{V,gr}$	-	-	**5,2**	kWh/kg (ar)
nitrogen content*	≤ 0,3	≤ 0,5	**0,12**	% in mass (db)
sulphur content	≤ 0,04	≤ 0,04	**0,006**	% in mass (db)
chlorine content	≤ 0,02	≤ 0,02	**<0,005**	% in mass (db)
arsenic	≤ 1	≤ 1	**<0,5**	mg/kg (db)
cadmium	≤ 0,5	≤ 0,5	**<0,1**	mg/kg (db)
chromium	≤ 10	≤ 10	**<1**	mg/kg (db)
copper	≤ 10	≤ 10	**1,6**	mg/kg (db)
lead	≤ 10	≤ 10	**<0,5**	mg/kg (db)
mercury	≤ 0,1	≤ 0,1	**<0,075**	mg/kg (db)
nickel	≤ 10	≤ 10	**<1**	mg/kg (db)
zinc	≤ 100	≤ 100	**<5**	mg/kg (db)
shrinking temperature SST	-	-	**870**	°C
deformation temperature DT	≥ 1200	≥ 1100	**1430**	°C
hemisphere temperature HT	-	-	**>1500**	°C
flow temperature FT	-	-	**>1500**	°C

db… dry basis, ar… as received, *… performed by non accredited subcontractor, **… tested on resample no.:BEA260679-3 received on 2026-08-25

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director in charge

Eva Füssl-Föger

Institut für Bioenergie GmbH Ingenieurbüro für technische Chemie

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Order date:	2026-06-18
Receipt of samples:	2026-07-13; 2026-08-25
Sample(s):	Wood pellets; “RS 007”
Testing period:	2026-07-13 – 2026-08-26
Sample details:	15 kg pellets in bag class A1 from bagging line; internal sample no.: BEA260679-1 and 15 kg pellets resample bag class A1 received on 2026-08-25; internal sample no.: BEA260679-3

testing methods	**standard**
diameter and length	ISO 17829:2024
moisture content	ISO 18134-2:2024
ash content	ISO 18122:2022
mechanical durability	ISO 17831-1:2025
fines content < 3,15 mm	ISO 5370:2023
net calorific value /gross calorific value	ISO 18125:2017
bulk density	ISO 17828:2025
carbon, hydrogen, nitrogen content	ISO 16948:2015
chlorine, sulphur content	ISO 16994:2016, quantification according to ISO 10304-1:2016
minor elements	ISO 16968:2015, quantification according to ISO 17294-2:2023
ash melting behaviour	ISO 21404:2020, ash preparation at 815°C, oxidizing atmosphere
coarse pellets fines 3,15 < CPF < 5,6 mm	ISO 5370:2023
particle density	ISO 18847:2024

remarks

none

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Date of report: 2026-07-27

Client: Sparrow d.o.o.

Address: Marina Marinovica 1, 37260 Varvarin, SERBIA

Order: Fuel testing according EN*plus*® certification program of wood pellets EN*plus*® ST.1001:2022

Order date: 2026-06-18 **Receipt of samples:** 2026-07-13

Sample(s): Wood pellets; "RS 007" **Testing period:** 2026-07-13 – 2026-07-24

Sample details: 15 kg pellets in bag class A2 from bagging line; internal sample no.: BEA260679-2

BEA260679			**-2**	
parameter EN*plus* ®	limit values A1	limit values A2	**class A2**	unit
diameter	6 ± 1, 8 ± 1	6 ± 1, 8 ± 1	**6,1**	mm (ar)
length (3,15 ≤ L ≤ 40 mm)	(3,15 ≤ L ≤ 40)	(3,15 ≤ L ≤ 40)	**18,1 ± 6,6**	mm (ar)
length (40 < L ≤ 45 mm)	≤ 1	≤ 1	**0,1**	% in mass (ar)
length (> 45 mm)	0	0	**0**	piece(s)
share of pellets with a length < 10mm	-	-	**3,0**	% in mass (ar)
category L < 20%, 20%≤ M ≤ 30%, S > 30%	-	-	**L**	-
amount of pellets for length determination	≥ 100	≥ 100	**1 170**	piece(s)
moisture content	≤ 10,0	≤ 10,0	**5,4**	% in mass (ar)
ash content	≤ 0,70	≤ 1,20	**0,91**	% in mass (db)
mechanical durability	≥ 98,0	≥ 97,5	**98,7**	% in mass (ar)
bulk density	600 ≤ BD ≤ 750	600 ≤ BD ≤ 750	**650**	kg/m³ (ar)
particle density	-	-	**1,32**	g/cm³ (ar)
coarse fines (3,15 ≤ CPF < 5,6 mm)	-	-	**0,3**	% in mass (ar)
fines content (< 3,15 mm), bulk	≤ 1	≤ 1	**-**	% in mass (ar)
fines content (< 3,15 mm), bags	≤ 0,5	≤ 0,5	**0,1**	% in mass (ar)
net calorific value $q_{P,net}$	≥ 16,5	≥ 16,5	**17,3**	MJ/kg (ar)
net calorific value $q_{P,net}$	≥ 4,6	≥ 4,6	**4,8**	kWh/kg (ar)
net calorific value $q_{P,net}$	-	-	**18,4**	MJ/kg (db)
net calorific value $q_{P,net}$	-	-	**5,1**	kWh/kg (db)
gross calorific value $q_{V,gr}$	-	-	**18,7**	MJ/kg (ar)
gross calorific value $q_{V,gr}$	-	-	**5,2**	kWh/kg (ar)
nitrogen content*	≤ 0,3	≤ 0,5	**0,12**	% in mass (db)
sulphur content	≤ 0,04	≤ 0,04	**0,007**	% in mass (db)
chlorine content	≤ 0,02	≤ 0,02	**0,006**	% in mass (db)
arsenic	≤ 1	≤ 1	**<0,5**	mg/kg (db)
cadmium	≤ 0,5	≤ 0,5	**0,14**	mg/kg (db)
chromium	≤ 10	≤ 10	**<1**	mg/kg (db)
copper	≤ 10	≤ 10	**1,9**	mg/kg (db)
lead	≤ 10	≤ 10	**<0,5**	mg/kg (db)
mercury	≤ 0,1	≤ 0,1	**<0,075**	mg/kg (db)
nickel	≤ 10	≤ 10	**<1**	mg/kg (db)
zinc	≤ 100	≤ 100	**5,8**	mg/kg (db)
shrinking temperature SST	-	-	**860**	°C
deformation temperature DT	≥ 1200	≥ 1100	**1410**	°C
hemisphere temperature HT	-	-	**>1500**	°C
flow temperature FT	-	-	**>1500**	°C

db… dry basis, ar… as received, *… performed by non accredited subcontractor

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Sample(s):	Wood pellets; “RS 007”
Testing period:	2026-07-13 – 2026-07-24
Sample details:	15 kg pellets in bag class A2 from bagging line; internal sample no.: BEA260679-2

testing methods	**standard**
diameter and length	ISO 17829:2024
moisture content	ISO 18134-2:2024
ash content	ISO 18122:2022
mechanical durability	ISO 17831-1:2025
fines content < 3,15 mm	ISO 5370:2023
net calorific value /gross calorific value	ISO 18125:2017
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