

Lab Test Report n°: **24WL0095501** of **14/10/2024**

Customer.
ENAMA Servizi S.r.l.
Via Venafro, 5
00159 ROMA RM

Acceptance Date: 17/09/2024
Test Beginning Date: 17/09/2024
Test Result Date: 14/10/2024

Sampling data provided by the client

Sample's data provided by the client

Sampling data provided by the client

Matrix: Solid biofuels
Description: Pellet 6mm - PV263I-A1
Sample Weight: 15kg
Supplier: Italwood S.I.I
Origin: 1.2.1

Effected By: customer
Technician: Dario Ridolfi

Test Method	Result	Uncertainty	U.M.	LOQ	Class A1	Class A2	Class B
0 Fusibility of the ashes (pre-ashing temperature 815°C) <i>NF EN ISO 21404:2020</i>							
0 Shrinkage temperature <i>NF EN ISO 21404:2020</i>	1240	±48	°C				
0 Deformation temperature <i>NF EN ISO 21404:2020</i>	> 1500		°C		>= 1200	>= 1100	>= 1100
0 Flow temperature <i>NF EN ISO 21404:2020</i>	> 1500		°C				
0 Hemisphere temperature <i>NF EN ISO 21404:2020</i>	> 1500		°C				
Diameter <i>UNI EN ISO 14780:2019 + UNI EN ISO 17829 : 2016</i>	6,0	±0,3	mm		5÷7	5÷7	5÷7
Mean length <i>UNI EN ISO 14780:2019 + UNI EN ISO 17829 : 2016</i>	18,9	±2,4	mm	3,1	3,15÷40	3,15÷40	3,15÷40
Pellets with length <= 10 mm <i>UNI EN ISO 14780:2019 + UNI EN ISO 17829 : 2016</i>	1,7	±0,2	w-%	0,1			
Pellets with length > 40mm <i>UNI EN ISO 14780:2019 + UNI EN ISO 17829 : 2016</i>	< 0,1		w-%	0,1	1	1	1
Pellets with length > 45 mm <i>UNI EN ISO 14780:2019 + UNI EN ISO 17829 : 2016</i>	0			0	0	0	0
Moisture <i>UNI EN ISO 14780:2019 + UNI EN ISO 18134-1:2022</i>	5,5	±0,3	w-%	1,0	10,0	10,0	10,0
Ash at 550° <i>UNI EN ISO 14780:2019 + UNI EN ISO 18122 : 2023</i>	0,44	±0,05	w-% d.m.	0,10	0,70	1,20	2,00
Mechanical durability <i>UNI EN ISO 14780:2019 + UNI EN ISO 17831-1:2016</i>	98,8	±0,3	w-%		>= 98,0	>= 97,5	>= 96,5

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Fines (< 3,15 mm) (bags) (as received) <i>UNI EN ISO 14780:2019 + ISO 18846:2016</i>	0,5	±0,1	w-%	0,1	0,5	0,5	
Coarse pellet fines <i>UNI EN ISO 14780:2019 + ISO 18846:2016</i>	0,9	±0,1	w-%	0,1			
^o Net calorific value <i>ISO 18125:2018</i>	4,8	±0,2	kWh/kg	1,0	>= 4,6	>= 4,6	>= 4,6
^o Gross calorific value <i>ISO 18125:2018</i>	5,2	±0,2	kWh/kg	1,0			
Particle density <i>UNI EN ISO 14780:2019 + ISO 18847:2016</i>	1,25		g/cm3	0,10			
Bulk density <i>UNI EN ISO 14780 : 2019 + UNI EN ISO 17828:2016</i>	700	±29	kg/m3	10	600÷750	600÷750	600÷750
* Additives (data provided by the customer)	0,0		w-%		2	2	2
Arsenic <i>UNI EN ISO 14780:2019 + ISO 16968:2015 + UNI EN ISO 16170:2016</i>	< 0,4		mg/kg d.m.	0,4	1	1	1
Cadmium <i>UNI EN ISO 14780:2019 + ISO 16968:2015 + UNI EN ISO 16170:2016</i>	< 0,2		mg/kg d.m.	0,2	0,5	0,5	0,5
Chromium <i>UNI EN ISO 14780:2019 + ISO 16968:2015 + UNI EN ISO 16170:2016</i>	0,7	±0,2	mg/kg d.m.	0,2	10	10	10
Mercury <i>UNI EN ISO 14780:2019 + ISO 16968:2015 + UNI EN ISO 16170:2016</i>	< 0,04		mg/kg d.m.	0,04	0,1	0,1	0,1
Nickel <i>UNI EN ISO 14780:2019 + ISO 16968:2015 + UNI EN ISO 16170:2016</i>	0,4	±0,1	mg/kg d.m.	0,2	10	10	10
Lead <i>UNI EN ISO 14780:2019 + ISO 16968:2015 + UNI EN ISO 16170:2016</i>	0,5	±0,1	mg/kg d.m.	0,2	10	10	10
Copper <i>UNI EN ISO 14780:2019 + ISO 16968:2015 + UNI EN ISO 16170:2016</i>	1,2	±0,3	mg/kg d.m.	0,4	10	10	10
Zinc <i>UNI EN ISO 14780:2019 + ISO 16968:2015 + UNI EN ISO 16170:2016</i>	11,7	±2,0	mg/kg d.m.	2,0	100	100	100
^o Nitrogen <i>UNI EN ISO 16948:2015</i>	< 0,1		w-% d.m.	0,1	0,3	0,5	1,0
^o Chlorine <i>UNI EN ISO 16994:2017 Met A + UNI EN ISO 10304-1:2009</i>	< 0,01		w-% d.m.	0,01	0,02	0,02	0,03
^o Sulphur <i>UNI EN ISO 16994:2017 Met A + UNI EN ISO 10304-1:2009</i>	< 0,01		w-% d.m.	0,01	0,04	0,04	0,05

Limit: Limits ISO 17225-2 (6mm)

LOQ: limit of quantification; U.M.: unit of measure

>lim: the parameters indicated by the symbol on the side are out of limits.

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Water & Life Lab srl
(Groupe Carso) - Società unipersonale

Laboratory with quality management system certified according to the regulation
UNI EN ISO 9001: 2015 by DNV. Certificate n° 267539-2018-AQ-ITA-ACCREDIA

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(*) : The starred Tests are not ACCREDIA qualified

(°): The analyzes are performed by an external laboratory

Determinations of Nitrogen, Chlorine and Sulphur were carried out by an ACCREDIA accredited laboratory with number 0059.

The container used for the determination of the bulk density complies with the requirements of point 5.1.3 of the method.

The result of Pellet length is the average of 50 measurements and the standard deviation calculated is 5.31.

The result of Pellet diameter is the average of 10 measurements and the standard deviation calculated is 0.09.

For the division of the sample, paragraph 8.6 of the UNI EN ISO 14780: 2019 standard has been applied.

The Mass of the Test portion for the determination of fines is 9407 g.

Determinations of Net calorific value and Gross calorific value were carried out by an ACCREDIA accredited laboratory with number 0059.

The digestion of the sample intended for metal analysis has been performed with hydrogen peroxide and nitric acid.

The determination of the metals has been performed in ICP-OES.

Determinations of ash fusion, temp. of contraction, temp. of deformation, temp. of hemisphere, temp. slides were carried out by an COFRAC accredited laboratory with number 1-0273.

Notes:

Uncertainty is expressed in the units of measurement of the parameter to which they refer. The coverage factor is $k = 2$ with a 95% probability range.

For microbiological analysis, expressed on all matrix except waters, combined standard uncertainty is estimated according ISO 19036 as intralaboratory reproducibility standard deviation.

For microbiological analysis the expression of the result as "present / absent" for qualitative tests is to be intended as synonymous of the more correct wording "detected / not detected".

Water & Life Lab S.r.l. is registered, to the Lombardy Region Register of the laboratories that are authorized to perform analysis in the field of the self-control procedures of food industries with the progressive number 030016301004 (based on the General Health Management act number 893 of February 2nd 2011).

The Laboratory does not consider the rounding of the data and the uncertainty of measurement in comparison with the limits that may be applied in the Test Report.

If the sampling is not performed by Water & life lab, the results reported in this test report refer to the sample as received.

The laboratory declines all responsibility for the sample data provided by the client.

The results reported on this lab test report are exclusively referred to the tested sample.

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Scientific Direction
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Order of Chemists and Physicists of
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End of the test report n° **24WL0095501**