

DIN CERTCO GMBH
Monsieur Lamine BADJI
Alboinstraße 56
D-12103 BERLIN
ALLEMAGNE

ANALYTICAL REPORT

Analytical Report Number : AR-24-EM-019029-01 Version of : 09/12/2024
Batch N° : 24Q009259 Reception Date : 12/11/2024
Batch Reference :
Order Reference : PO 2179302 Affaire : 3397829

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Sampl	Matrix	Sample reference	Observations
001	Biofuel, solid	AEB 2024	Client

Samples preservation

The samples will be stored 4 weeks after the receipt at the laboratory.

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Sample n° **24Q009259-001**

Référence : AEB 2024

Sampling date : 28/10/2024

Start of analysis : 14/11/2024

Preparations - Interpretations

	Result	Unit	Limit
FH0E8 : Preparation solid biofuel for analysis Test done on Saverne COFRAC TESTING 1-6313 Preparation [Drying of the sample not exceeding 40°C or not, then grinding of the sample] - NF EN ISO 14780	*		
FH0E6 : Total humidity of solid biofuel Test done on Saverne COFRAC TESTING 1-6313 Gravimetry [Drying in a ventilated oven to constant mass at 105°C] - NF EN ISO 18134-2 : 2024	5.9	% rw	<= 10

Thermogravimetric analysis

		Result	Unit	Limit
FH0DC : Ash at 550 ° C Test done on Saverne COFRAC TESTING 1-6313				
Thermo-gravimetry [Calcination/mass loss measurement] - NF EN ISO 18122 : 2022				
Ash at 550 °C _ Dry basis	*	0.49	% DM	x <= 0.6
Ash at 550 °C _ As received	*	0.46	% rw	

Elementar analysis

		Result	Unit	Limit
FHAЕ3 : Nitrogen (N) for solid biofuels Test done on Saverne COFRAC TESTING 1-6313				
Combustion [High temperature combustion] - NF EN ISO 16948				
Nitrogen (N) dry basis	*	0.09	% DM	<= 0.3
Nitrogen (N) as received	*	0.08	% rw	
FHAB4 : Chlorine (Cl) content for solid biofuel Test done on Saverne COFRAC TESTING 1-6313				
Combustion [Combustion / Ion chromatography] - NF EN ISO 16994 (method A)				
chlorine as received	*	<0.02	% rw	
Chlorine dry basis	*	<0.02	% DM	<= 0.02
Chlorine dry basis	*	<200	mg/kg dry matter	

FHAB2 : Sulphur content for solid biofuel Test done on Saverne COFRAC TESTING 1-6313

Combustion [Calcination/mass loss measurement] - NF EN ISO 16994 (method A)

Sulphur (S) as received	*	<0.02	% rw	
Sulphur (S) dry basis	*	<0.02	% DM	<= 0.04

FHA2 : Hydrogen (H) for solid biofuels Test done on Saverne COFRAC TESTING 1-6313

Combustion [High temperature combustion and measurement of hydrogen content by instrumental analysis] - NF EN ISO 16948

Hydrogen (H) dry basis	*	6.07	% DM	
Hydrogen (H) as received	*	5.72	% rw	

Calorific value

	Result	Unit	Limit
FHA4 : Gross calorific value for solid biofuels Test done on Saverne COFRAC TESTING 1-6313			
Combustion [Combustion / Calorimetry] - NF EN ISO 18125			
Gross calorific value dry basis	*	19879	kJ/kg dry matter

EUROFINS ANALYSES DES MATERIAUX ET COMBUSTIBLES France SAS

20 rue du Kochersberg

67700 Saverne

SAS au capital de 115 750 €

APE 7120B RCS SAVERNE 529294100

TVA FR72529294100

Tél 03 88 021 562 - fax 03 88 916 531

Mail : Combustibles@Eurofins.com

ACCREDITATION
N°1-6313
Scope available on
www.cofrac.fr



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Calorific value

		Result	Unit	Limit
FHAЕ4 : Gross calorific value for solid biofuels Test done on Saverne COFRAC TESTING 1-6313 Combustion [Combustion / Calorimetry] - NF EN ISO 18125				
Gross calorific value as received	*	18715	kJ/kg Raw Product	
FHAЕ5 : Net calorific value for solid biofuels Test done on Saverne COFRAC TESTING 1-6313 Calculation - NF EN ISO 18125				
Net calorific value dry basis	*	18628	kJ/kg dry matter	
Net calorific value as received	*	17403	kJ/kg Raw Product	16500<= x <= 30000
EM056 : calorific value (KWh/kg) Test done on Saverne Combustion - calculation				
Low calorific value (kWh/kg)		5.20	kWh/kg Raw Product	
Net calorific value (kWh/kg)		4.83	kWh/kg Raw Product	

Physical properties

		Result	Unit	Limit
FHAЕ6 : Level of fines Test done on Saverne COFRAC TESTING 1-6313 Mechanical - NF EN ISO 18846 - NF EN ISO 5370 : 2023				
Level of fines	*	0.30	%	<= 0.5
Mass	*	15050.2	g	
EMСРF : Coarse pellet fines (3,15 mm < CPF < 5,6 mm) Test done on Saverne COFRAC TESTING 1-6313 Mechanical - NF EN ISO 5370 : 2023	*	0.2	%	
FH0KK : Bulk density for samples ≤ 12mm Test done on Saverne COFRAC TESTING 1-6313 Volumetry - NF EN ISO 17828				
volume of the container	*	4.9	l	
Bulk density	*	601	kg/m³	600<= x <= 750
FD00P : Dimensions of wood pellets Test done on Saverne COFRAC TESTING 1-6313 Mechanical - NF EN ISO 17829				
Length	*	15	mm	3.15<= x <=40
Diameter	*	6.4	mm	5<= x <= 9
Lower length at 3,15 mm	*	0.0	%	
Share of pellets with a length < 10mm	*	7.2	%	
Lenght between 3.15 to 40 mm	*	100	%	99<= x <=1000
Lenght between 40 to 45 mm	*	0.0	%	
Lenght > 45 mm	*	0.0	%	
Class	*	D06		

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Physical properties

	Result	Unit	Limit
FD00P : Dimensions of wood pellets Test done on Saverne COFRAC TESTING 1-6313			
Mechanical - NF EN ISO 17829			
Standard deviation length	*	4.9	mm
Standard deviation diameter	*	0.2	mm

Subcontracting | Eurofins Umwelt Ost GmbH

	Result	Unit	Limit
FR0DY : Mechanical durability in pellets [solid biofuels] % Test subcontracted to Eurofins Umwelt Ost GmbH (Freiberg) DIN EN ISO/IEC 17025:2018 DAkkS D-PL-14081-01-00 Mechanical - DIN EN ISO 17831-1: 2016-05	97.7	% (w/w)	98<= x <= 100
FR03D : Arsenic [solid biofuels] mg/kg ds Test subcontracted to Eurofins Umwelt Ost GmbH (Freiberg) DIN EN ISO/IEC 17025:2018 DAkkS D-PL-14081-01-00 ICP-MS - DIN EN ISO 17294-2 (E29): 2017-01	< 0.8	mg/kg	x <= 1
FR03F : Lead [solid biofuels] mg/kg ds Test subcontracted to Eurofins Umwelt Ost GmbH (Freiberg) DIN EN ISO/IEC 17025:2018 DAkkS D-PL-14081-01-00 ICP-MS - DIN EN ISO 17294-2 (E29): 2017-01	< 2	mg/kg	x <= 10
FR03G : Cadmium [solid biofuels] mg/kg ds Test subcontracted to Eurofins Umwelt Ost GmbH (Freiberg) DIN EN ISO/IEC 17025:2018 DAkkS D-PL-14081-01-00 ICP-MS - DIN EN ISO 17294-2 (E29): 2017-01	< 0.2	mg/kg	x <= 0.5
FR03M : Copper [solid biofuels] mg/kg ds Test subcontracted to Eurofins Umwelt Ost GmbH (Freiberg) DIN EN ISO/IEC 17025:2018 DAkkS D-PL-14081-01-00 ICP-MS - DIN EN ISO 17294-2 (E29): 2017-01	1	mg/kg	x <= 10
FR03I : Chromium [solid biofuels] mg/kg ds Test subcontracted to Eurofins Umwelt Ost GmbH (Freiberg) DIN EN ISO/IEC 17025:2018 DAkkS D-PL-14081-01-00 ICP-MS - DIN EN ISO 17294-2 (E29): 2017-01	< 1	mg/kg	x <= 10
FR03S : Nickel [solid biofuels] mg/kg ds Test subcontracted to Eurofins Umwelt Ost GmbH (Freiberg) DIN EN ISO/IEC 17025:2018 DAkkS D-PL-14081-01-00 ICP-MS - DIN EN ISO 17294-2 (E29): 2017-01	< 1	mg/kg	x <= 10
FR03Y : Zinc [solid biofuels] mg/kg ds Test subcontracted to Eurofins Umwelt Ost GmbH (Freiberg) DIN EN ISO/IEC 17025:2018 DAkkS D-PL-14081-01-00 ICP-MS - DIN EN ISO 17294-2 (E29): 2017-01	6	mg/kg	x <= 100
FR04A : Mercury [solid biofuels] [AAS] mg/kg ds Test subcontracted to Eurofins Umwelt Ost GmbH (Freiberg) DIN EN ISO/IEC 17025:2018 DAkkS D-PL-14081-01-00 CV-AAS - DIN EN ISO 12846 (E12): 2012-08	< 0.05	mg/kg	x <= 0.1
FROME : Ash melting behaviour 815°C (oxidizing) [solid biofuels] Test subcontracted to Eurofins Umwelt Ost GmbH (Freiberg) DIN EN ISO/IEC 17025:2018 DAkkS D-PL-14081-01-00 Thermomicroscopy - DIN EN ISO 21404: 2020-06			
Shrinkage start temp SST	*	1080	°C
Deformation temp DT	*	1500	°C
Hemisphere temp HT	*	> 1500	°C
Flow temp FT	*	> 1500	°C
FR0E1 : particle density [solid biofuels] kg/m³ Test subcontracted to Eurofins Umwelt Ost GmbH (Freiberg) DIN EN ISO/IEC 17025:2018 DAkkS D-PL-14081-01-00 Densimetry - DIN EN ISO 18847: 2016-12	1.10	g/cm³	

Criteria from : DINplus version 2021-11 _ Norme 17225-2

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Conclusion / Declaration of conformity (Not covered by accreditation) :

L'échantillon analysé est non satisfaisant pour au moins un des critères étudiés. Pour déclarer, ou non, la conformité à la spécification, il n'a pas été tenu explicitement compte de l'incertitude associée au résultat.

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Only results identified by * are covered by an accreditation delivered by a organization having signed international recognition agreements.

All changes are identified by bold, italics and underlining when a new version of the report is issued.

Uncertainty has not been taken into account when declaring conformity with the specification and quality criteria. Results that do not comply with the quality limits or reference are indicated by a black circle ●.

The results preceded by the sign < correspond to the limits of quantification, they are the responsibility of the laboratory and depend on the matrix.

All elements of traceability and uncertainty (determined with $k = 2$) are available on request.



Caroline Gross
Analytical Service Manager