

Analytical Report

Control Union Certifications Germany GmbH

Attn: . .
Bornitzstraße 73-75
D-10365 Berlin
Germany

Reportnr. : **1796904 version 1**
Sample Arrival Date : 20-Nov-2023 11:04
ReportDate Version : **28-Nov-2023 14:37**
Packing : Plastic, ambient
Sampling Date * : 06-Nov-2023
Samplesize (kg) : 9,749
Seal / Seal Code : No /

Sample information *

Disponent Number : YRN/A1/0611_1
Product specification : Wood pellets
Reference : PRJ: 898830
AWB / BarCode : CO300203315EE

Disp. Remark : Client: Yohraiten LLC

* Information supplied by customer (TLR takes no responsibility for this information).

Composition Determination

Parameter	Result (as received)	Result (on dry)	Result (as det)	Result (dry ash free)		
Total Moisture	8,66			%	Q	R
Moisture Airdry			6,42	%	Q	R
Ash	0,55	0,61	0,57	%	Q	R
Volatile matter incl. moisture.			85,77	%	Q	R
Volatile matter	77,45	84,80	79,35	85,31 %		
Fixed Carbon	13,33	14,60		%		
Gross Calorific Value	4554,3	4986,1	4666,2	5016,6 kcal/kg	Q	R
	19,07	20,88	19,54	21,00 GJ/mt		
Nett Calorific Value (cV)	8197,8	8975,0	8399,2	9029,9 B.T.U.'s/Lb		
	4230,2			kcal/kg	Q	
	17,71			GJ/mt		
	7614,3			B.T.U.'s/Lb		
	4,9			kWh/kg		
Nett Calorific Value (cP)	17,63			GJ/mt	Q	
Emissionfactor CO2 (cV)	97,20			t CO2/TJ		
Emissionfactor CO2 (cP)	97,63			t CO2/TJ		
Hydrogen	5,61	6,15	6,47	6,18 %	Q	R
Carbon	46,95	51,40	48,10	51,71 %	Q	R
Nitrogen.	< 0,05	< 0,05	< 0,05	< 0,05 %	Q	R
S. (Sulfer)	< 0,010	< 0,010	< 0,010	< 0,010 %	Q	R
Oxygen (by difference)				42,050 %		

Preparation

Common

Parameter	Result (as received)	Result (on dry)	Result (as det)			
Preparation sample	Biomass preparation in accordance with NEN-EN-ISO21646				Q	R

Composition Determination

Common

Parameter	Result (as received)	Result (on dry)	Result (as det)
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AFT. (oxid) DT		1250	gr. C		R
Diameter pellets (n=25)	6,2		mm	Q	R
Length of pellets	13,0		mm	Q	R
Sieve < 3,15 mm.	0,28		%		R

Metal and other elements

Parameter	Result (as received)	Result (on dry)	Result (as det)		
Cd (Cadmium)	0,134	0,146	0,137	mg/kg	Q R
Pb (Lead)	0,06	0,07	0,07	mg/kg	Q R
As (Arsenic)	< 0,040	< 0,040	< 0,040	mg/kg	Q R
Hg (Mercury)	< 0,020	< 0,020	< 0,020	mg/kg	Q R
Ni (Nickel)	< 3,0	< 3,0	< 3,0	mg/kg	Q R
Cl (Chlorine)	< 0,005	< 0,005	< 0,005	%	Q R
Cr.(Chromium)	< 5,0	< 5,0	< 5,0	mg/kg	R
Cu.(Copper)	< 5,0	< 5,0	< 5,0	mg/kg	R
Zn. (Zinc)	6,7	7,3	6,8	mg/kg	R

Parameter	Result (as received)	Result (on dry)	Result (as det)		
Sieve < 5,6 mm			0,4	%	R

Other Analysis

Common

Parameter	Result (as received)	Result (on dry)	Result (as det)		
Mechanical Durability	98,9			%	Q R
Bulk density-	622			kg/m3	Q R
Particle density			1,26	g/cm3	R
Share of pellets< 10mm			15,2	w %	R
Category	Category L				R

Q - Analyses ISO 17025 accredited by RvA (ILAC)
 R - Carried out by TLR International Laboratories, location Ridderkerk

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ANNEX

Method Descriptions

Composition Determination

Common

Method Description

Determination of ash; gravimetric method
Coal: NEN-ISO 1171 Biomass: NEN-EN15403; Secondary bio fuels: NEN-EN- ISO 18122

Determination of carbon (C), nitrogen (N), hydrogen (H) with the element analyser
Coal : NEN-ISO29541, Biomass: NEN-EN-ISO 16948 : Secondary bio fuels NEN-EN 15407

Determination of fusibility of ash; ash formed (815°C), cube form

Determination of gross calorific value by bombcaloric method and calculation of net calorific value
Coal: NEN-ISO 1928, Solid Biofuels NEN-EN-ISO18125; secondary biofuels NEN-EN15400

Determination of moisture in the analyse sample; gravimetric method
Coal: NEN-ISO 11722;Biomass: NEN-EN-ISO 18134-3; Secondary bio fuels : NEN-EN15414-3

Determination of Sulphur (S); NEN-EN-ISO 16994

Determination of the amount of material passing through a sieve with 3,15 mm diameter round hole ISO 18846:2016

Determination of the length and diameter of the woodpellets; Own method

Determination of total moisture in the sample; gravimetric method
Coal:NEN-ISO-589 MB biomasss: NEN-EN-ISO 18134-1; Secondary bio fuels : NPR-CEN/TS 15414-1

Determination of volatile matter content; gravimetric method
Coal: NEN-ISO 562; Biomass: NEN-EN-ISO 18123; secondary biofuels: NEN-EN 15402

Method Code

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NEN-EN-ISO 21404

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Acc. NEN-EN-ISO17829

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Metal and other elements

Method Description

Determination of Chlorine (Cl); Ion chromatography
Biomass: according NEN-EN-ISO 16994 Coal: Own method

Determination of mercury (Hg); CV-AAS

Determination of minor elements. As, Cd, Co, Cr, Cu, Hg, Mn, Mo, Ni, Pb, Sb, V and Zn

Method Code

NEN-EN-ISO 16994

Acc. NEN-EN-ISO16968

eq.nen-en-iso16968

Method Description

Determination of the amount of material passing through a sieve with 3,15 mm diameter round hole ISO 18846:2016

Method Code

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Other Analysis

Common

Method Description

Determination of bulk density (poured) bulk density
Determination of mechanical durability of pellets
Determination of Share of pellets with a length < 10 mm

Method Code

Acc.NEN-EN-ISO 17828
NEN-EN-ISO 17831-1
ISO 18847

Abbreviations:

acc: in accordance with
eq: Equivalent to

Demanded 20-Nov-2023 by Control Union Certifications Germany GmbH
Analyses according to annex
P.W. Platteschor, Managing Director TLR International Laboratories

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