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Analytical Report

Control Union Certifications Germany GmbH
Attn: . .
Dorotheastrasse 30
D-10318 Berlin
Germany

Reportnr.	: **1129636 version 1**		
Sample Arrival Date	: 08-Nov-2020 12:12	Sampling Date *	: 26-Oct-2020
ReportDate Version	: **17-Nov-2020 11:35**	Samplesize (kg)	: 15,072
Packing	: Plastic, ambient		

Sample information *

Disponent Number	: PRJ 843034	Product specification	: 6 mm wood pellets
Sealed / Seal Code	: No /	Reference	: Pellet Energy Ukraine - A2
Disp. Remark	: Control Union / Pellet Energy Ukraine; 2, Lenin str. 11201 Emilchino zhytomir region UKRAINE		

*** 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	5,47				%		O
Moisture Airdry			6,89		%	Q	R
Ash	0,41	0,43	0,40		%	Q	R
Volatile matter incl. moisture.			85,73		%	Q	R
Volatile matter	80,04	84,67	78,84	85,04	%		
Fixed Carbon	14,08	14,90			%		
Gross Calorific Value	4650,0	4919,1	4580,0	4940,3	kcal/kg	Q	R
	19,47	20,60	19,18	20,68	GJ/mt		
	8370,1	8854,4	8244,0	8892,6	B.T.U.'s/Lb		
Nett Calorific Value (cV)	4335,4				kcal/kg	Q	
	18,15				GJ/mt		
	7803,7				B.T.U.'s/Lb		
	5,0				kWh/kg		
Nett Calorific Value (cP)	18,08				GJ/mt	Q	
Emissionfactor CO2 (cV)	97,59				t CO2/TJ		
Emissionfactor CO2 (cP)	98,00				t CO2/TJ		
Hydrogen	5,78	6,11	6,46	6,14	%	Q	R
Carbon	48,31	51,10	47,58	51,32	%	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)				42,480	%		

Preparation

Common

Parameter	Result (as received)	Result (on dry)	Result (as det)			
Preparation sample	B-wood preparation according NEN EN 14780 and NEN EN 15443				Q	R

Composition Determination

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Common

Parameter	Result (as received)	Result (on dry)	Result (as det)			
AFT. (oxid) DT			1520	gr. C		R
Diameter pellets (n=25)			6,1	mm	Q	R
Length of pellets			12,8	mm	Q	R
Sieve < 3,15 mm.			0,2	%		R

Metal and other elements

Parameter	Result (as received)	Result (on dry)	Result (as det)			
Cd (Cadmium)	0,101	0,106	0,099	mg/kg	Q	R
Pb (Lead)	0,12	0,13	0,12	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)	5,9	6,2	5,8	mg/kg		R

Other Analysis

Common

Parameter	Result (as received)	Result (on dry)	Result (as det)			
Mechanical Durability			98,8	%	Q	R
Bulk density			669	kg/m3	Q	R

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Parameter	Result (as received)	Result (on dry)	Result (as det)			
Samplestorage.	Storage for 6 months					R

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

Demanded 08-Nov-2020 by Control Union Germany GmbH
Analyses according to annex
Drs. ing. H. Janssens Director TLR International Laboratories

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ANNEX

Method Descriptions

Composition Determination

Common

Method Description	Method Code
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; acc EN-plus, ash formed (815°C), cube form	Own method
Determination of gross caloric value by bombcaloric method and calculation of net caloric value Coal: NEN-ISO 1928, Solid Biofuels NEN-EN-ISO18125; secundairy 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	Acc. NEN-EN-ISO17829
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; secundairy biofuels: NEN-EN 15402	.

Metal and other elements

Method Description	Method Code
Determination of chloride (Cl); Ion chromatography Biomass: according NEN-EN-ISO 16994 Coal: Own method	..
Determination of mercury (Hg); CV-AAS	Acc. NEN-EN-ISO16968
Determination of minor elements. As, Cd, Co, Cr, Cu, Hg, Mn, Mo, Ni, Pb, Sb, V and Zn	eq.nen-en-iso16968

Other Analysis

Common

Method Description	Method Code

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Determination of bulk density (poured) bulk density	Acc.NEN-EN-ISO 17828
Determination of mechanical durability of pellets	NEN-EN-ISO 17831-1

Abbreviations:
acc: in accordance with
eq: Equivalent to

Demanded 08-Nov-2020 by Control Union Germany GmbH
Analyses according to annex
Drs. ing. H. Janssens Director TLR International Laboratories