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INTERNATIONAL LABORATORIES

Analytical Report

Top Pellets Europe B.V.
Attn: Marcel Reijne
Rustenburgerweg 3
1646 WJ Alkmaar
Netherlands

Reportnr.	: **1080976 version 1**	Disponent Number	:
Product recognized as	: Hout/Wood/Bois/Holz/Madera		
Product Specification	: DL WIT.woodpellets.6mm.06.2020	Sampling Date	: 12-Jun-2020
Reference	:	Samplesize (kg)	: 2,379
AWB / BarCode	: 1100109356605010343001003077	Sealed / Seal Code	: No /
Packing	: Plastic, ambient	Sample Arrival Date	: 17-Jun-2020 08:00
Sample Type	: BIS	ReportDate Version	: **19-Jun-2020 22:01**

Composition Determination

Parameter	Result (as received)	Result (on dry)	Result (as det)	Result (dry ash free)			
Total Moisture	9,28				%		O
Moisture Airdry			8,55		%	Q	R
Ash	0,41	0,45	0,41		%	Q	R
Volatile matter incl. moisture.			86,34		%	Q	R
Volatile matter	77,17	85,06	77,79	85,45	%		
Fixed Carbon	13,14	14,49			%		
Gross Calorific Value	4390,9	4840,1	4426,2	4862,1	kcal/kg	Q	R
	18,38	20,26	18,53	20,36	GJ/mt		
	7903,6	8712,1	7967,1	8751,8	B.T.U.'s/Lb		
Nett Calorific Value (cV)	4079,4				kcal/kg	Q	
	17,08				GJ/mt		
	7342,9				B.T.U.'s/Lb		
	4,7				kWh/kg		
Nett Calorific Value (cP)	17,00				GJ/mt	Q	
Emissionfactor CO2 (cV)	99,91				t CO2/TJ		
Emissionfactor CO2 (cP)	100,40				t CO2/TJ		
Hydrogen	5,29	5,83	6,29	5,85	%	Q	R
Carbon	46,53	51,29	46,91	51,53	%	Q	R
Nitrogen.	0,11	0,12	0,11	0,12	%	Q	R
S. (Sulfer)	< 0,010	< 0,010	< 0,010	< 0,010	%	Q	R
Oxygen (by difference)				42,490	%		

Preparation

Common

Parameter	Result (as received)	Result (on dry)	Result (as det)			
Preparation sample	Biomass preparation in accordance with NEN EN 14780 and NEN EN 15443				Q	R

Composition Determination

Common

Parameter	Result (as received)	Result (on dry)	Result (as det)			
AFT. (oxid) DT			1460	gr. C		R
Diameter pellets (n=25)			6,3	mm	Q	R
Length of pellets			10,4	mm	Q	R

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Sieve < 3,15 mm.			0,3	%	R

Metal and other elements

Parameter	Result (as received)	Result (on dry)	Result (as det)			
Cd (Cadmium)	0,129	0,142	0,130	mg/kg	Q	R
Pb (Lead)	2,25	2,48	2,27	mg/kg	Q	R
As (Arsenic)	0,063	0,070	0,064	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)	0,009	0,010	0,009	%	Q	R
Cr.(Chromium)	< 5,0	< 5,0	< 5,0	mg/kg		R
Cu.(Copper)	63,1	69,5	63,6	mg/kg		R
Zn. (Zinc)	12,0	13,2	12,1	mg/kg		R

Other Analysis

Common

Parameter	Result (as received)	Result (on dry)	Result (as det)			
H.L. weight			584,9	kg/m3		R
Mechanical Durability			98,2	%	Q	R

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

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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

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Common

Method Description	Method Code
Determination of mechanical durability of pellets	NEN-EN-ISO 17831-1

Abbreviations:

acc: in accordance with

eq: Equivalent to

Demanded 17-Jun-2020 by Top Pellets Europe B.V.
Analyses according to annex
Drs. ing. H. Janssens Director TLR International Laboratories