

Analytical Report

Energy Pellets Moerdijk BV

Attn: Mr. Hylko Brandsma
Apolloweg 4 Harbour no. M189A
4782 SB Moerdijk
Netherlands

Reportnr. : 650653 version 1	Disponent Number : EPM.woodpellets.6mm.28.06.2016
Product recognized as : Hout/Wood/Bois/Holz/Madera	Sampling Date : 29-Jun-2016
Product Specification : EPM.woodpellets.6mm.28.06.2016	Sample size (kg) : 6,671
Reference :	Sealed / Seal Code : No /
AWB / BarCode :	Sample Arrival Date : 01-Jul-2016 08:00
Packing : Plastic, ambient	ReportDate Version : 07-Jul-2016 16:36
Sample Type : BIS	

Composition Determination

Parameter	Amount (a.r.)	Amount (o.d.)	Amount (as det.)	Amount (d.a.f.)		
Total Moisture	5,60				%	Q
Moisture Airdry			7,54		%	Q
Ash	0,63	0,66	0,61		%	Q
Volatile matter incl. moisture.			83,49		%	Q
Volatile matter	77,54	82,14	75,94	82,69	%	
Fixed Carbon	16,23	17,20			%	
Gross Calorific Value	4555,4	4825,7	4461,7	4857,8	kcal/kg	Q
	19,07	20,20	18,68	20,34	GJ/mt	
Nett Calorific Value (cV)	8199,7	8686,2	8031,0	8744,1	B.T.U.'s/Lb	
	4255,2				kcal/kg	
	17,82				GJ/mt	
	7659,4				B.T.U.'s/Lb	
Nett Calorific Value (cP)	17,74				GJ/mt	
Emissionfactor CO2 (cV)	99,63				t CO2/TJ	
Emissionfactor CO2 (cP)	100,00				t CO2/TJ	
Hydrogen	5,47	5,80	6,20	5,84	%	Q
Carbon	48,41	51,28	47,41	51,62	%	Q
Nitrogen.	0,21	0,23	0,21	0,23	%	Q
S. (Sulfer)	0,02	0,02	0,02	0,02	%	Q
Oxygen (by difference)				42,29	%	

Composition Determination

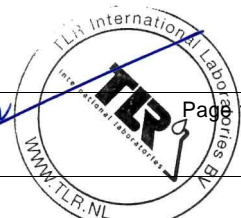
Common

Parameter	Amount (a.r.)	Amount (o.d.)	Amount (as det.)		
AFT. (oxid) DT			1440		gr. C
Diameter pellets (n=25)			5,9		mm
Length of pellets			11,3		mm
Sieve < 3,15 mm			0,4		%

Metal and other elements

Parameter	Amount (a.r.)	Amount (o.d.)	Amount (as det.)		
Cd (Cadmium)	0,093	0,098	0,091		mg/kg
Pb (Lead)	1,59	1,68	1,56		mg/kg
As (Arsenic)	0,086	0,091	0,084		mg/kg

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Analyses according to annex
Drs. ing. H. Janssens Director TLR International Laboratories



Page 1 of 4

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Hg (Mercury)	< 0,020	< 0,020	< 0,020	mg/kg	Q
Ni (Nickel)	< 3,0	< 3,0	< 3,0	mg/kg	Q
Cl (Chlorine)	0,016	0,017	0,016	%	Q
Cr.(Chromium)	< 5,0	< 5,0	< 5,0	mg/kg	
Cu.(Copper)	< 5,0	< 5,0	< 5,0	mg/kg	
Zn. (Zinc)	12,3	13,0	12,0	mg/kg	

Other Analysis

Common

Parameter	Amount (a.r.)	Amount (o.d.)	Amount (as det.)		
Mechanical Durability			98,0	%	Q
Bulk density			702,50	kg/m3	Q

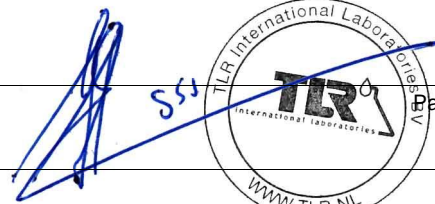
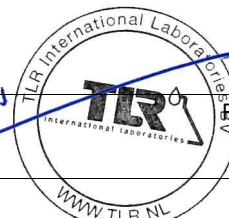
Preparation

Common

Parameter	Amount (a.r.)	Amount (o.d.)	Amount (as det.)		
Preparation sample			Biomass preparation according NEN-EN14780		Q

Q - Analysis accredited by RvA

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ANNEX

Method Descriptions

Composition Determination

Common

Method Description

Determination of ash; gravimetric method

Coal: NEN-ISO 1171 Biomass : EN-14775; Secondary bio fuels : NEN-EN-15403

Determination of carbon (C), nitrogen (N), hydrogen (H) with the element analyser

Coal : NEN-ISO29541, Biomass : NEN-EN 15104, Secondary bio fuels NEN-EN 15407

Determination of fusibility of ash; acc EN-plus, 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-EN14918; secondary biofuels NEN-EN15400

Determination of moisture in the analyse sample; gravimetric method

Coal: NEN-ISO 11722; Biomass: NEN-EN14774-3; Secondary bio fuels : NEN-EN15414-3

Determination of particle size distribution; vibrating screen method using sieve apertures of 3,15mm and below

Determination of Sulphur (S); NEN-EN 15289

Determination of the length and diameter of the woodpellets

Determination of total moisture in the sample; gravimetric method

Coal: ISO-589 biomass: NEN-EN14774-1; Secondary bio fuels : NEN-EN15414-1

Determination of volatile matter content; gravimetric method

Coal: NEN-ISO 562; Biomass: NEN-EN15148; secondary biofuels: NEN-EN 15402

Method Code

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Own method

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Acc. NEN-EN 15149-2

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Eq. NEN-EN 16127:201

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Method Code

eq. NEN-EN 15297

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eq. NEN-EN 15297

cf NEN EN 15297

acc. NEN-15297

Metal and other elements

Method Description

Determination of Vanadium (V), Cobalt (Co), Nickel (Ni)

Determination of chloride (Cl);

Destruction feeding stuffs: bomb calorimetric method; analysis: Ion chromatography

Biomass: according EN-15289/DIN51727 Coal: Own method

Determination of lead (Pb); ICP-MS,

Determination of mercury (Hg); GFAAS,

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


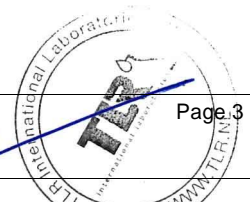
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Other Analysis

Common

Method Description

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Page 3 of 4

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Determination of bulk density (poured) and tamped bulk density
Determination of mechanical durability of pellets

Acc.NEN-EN-ISO 17828
acc. NEN-EN 15210-1

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