

## Analytical Report

### Control Union Poland Sp. z o.o.

Attn: Robert Knysak  
al. Wojska Polskiego 25/907  
65-950 Zielona Góra  
Poland

Reportnr.	: 641217 version 1	Disponent Number	:
Product recognized as	: Hout/Wood/Bois/Holz/Madera	Sampling Date	: 11-Apr-2016
Product Specification	: Wood pellets	Sample size (kg)	: 9,068
Reference	:	Sealed / Seal Code	: No /
AWB / BarCode	: %03077MB13059300030250101528	Sample Arrival Date	: 15-Apr-2016 15:35
Packing	: Plastic, ambient	ReportDate Version	: 25-May-2016 09:27
Sample Type	: BIS		
Seller Unloader	: Control Union Poland		
Disp. Remark	: Alwaax Biomass sp. Z o. o, Wljska Polskiego Str. 15, 64-500 Szamotuy, Poland		

### Composition Determination

Parameter	Amount (a.r.)	Amount (o.d.)	Amount (as det.)	Amount (d.a.f.)		
Total Moisture	8,08				%	Q
Moisture Airdry			6,94		%	Q
Ash	0,20	0,21	0,20		%	Q
Volatile matter incl. moisture.			85,93		%	Q
Volatile matter	78,02	84,88	78,98	85,06	%	
Fixed Carbon	13,71	14,91			%	
Gross Calorific Value	4465,9	4858,6	4521,2	4869,0	kcal/kg	Q
	18,70	20,34	18,93	20,39	GJ/mt	
Nett Calorific Value (cV)	8038,7	8745,5	8138,2	8764,2	B.T.U.'s/Lb	
	4154,2				kcal/kg	
	17,39				GJ/mt	
	7477,6				B.T.U.'s/Lb	
Nett Calorific Value (cP)	17,32				GJ/mt	
Emissionfactor CO2 (cV)	98,96				t CO2/TJ	
Emissionfactor CO2 (cP)	99,40				t CO2/TJ	
Hydrogen	5,43	5,91	6,27	5,92	%	Q
Carbon	46,94	51,07	47,52	51,18	%	Q
Nitrogen.	< 0,05	< 0,05	< 0,05	< 0,05	%	Q
S. (Sulfer)	< 0,01	< 0,01	< 0,01	< 0,01	%	Q
Oxygen (by difference)				42,86	%	

### Composition Determination

#### Common

Parameter	Amount (a.r.)	Amount (o.d.)	Amount (as det.)		
AFT. (oxid) DT			1490		gr. C
Diameter pellets (n=25)			6,1		mm
Length of pellets			14,3		mm
Sieve < 3,15 mm			0,2		%

#### Metal and other elements

Parameter	Amount (a.r.)	Amount (o.d.)	Amount (as det.)

Demanded 15-Apr-2016 by Control Union Poland Sp. z o.o.  
Analyses according to annex  
Drs. ing. H. Janssens Director TLR International Laboratories



TLR International Laboratories BV  
www.tlr.nl

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Cd (Cadmium)	0,094	0,102	0,095	mg/kg	Q
Pb (Lead)	0,06	0,07	0,06	mg/kg	Q
As (Arsenic)	< 0,040	< 0,040	< 0,040	mg/kg	Q
Hg (Mercury)	< 0,020	< 0,020	< 0,020	mg/kg	Q
Ni (Nickel)	< 3,0	< 3,0	< 3,0	mg/kg	Q
Cl (Chlorine)	< 0,005	< 0,005	< 0,005	%	Q
Cr.(Chromium)	< 5,0	< 5,0	< 5,0	mg/kg	
Cu.(Copper)	< 5,0	< 5,0	< 5,0	mg/kg	
Zn. (Zinc)	4,4	4,8	4,5	mg/kg	

### Other Analysis

Common Parameter	Amount (a.r.)	Amount (o.d.)	Amount (as det.)		
Mechanical Durability			99,2	%	Q
Bulk density			687,00	kg/m3	Q

### Preparation

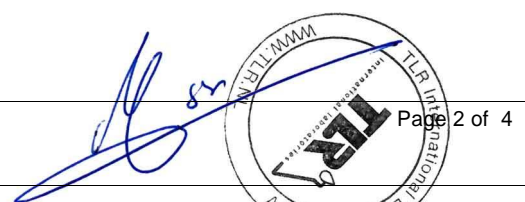
Common Parameter	Amount (a.r.)	Amount (o.d.)	Amount (as det.)		
Preparation sample	Biomass preparation according NEN-EN14780				Q

### Sample Remarks :

Woodpellets CH50031042, CH50031043, CH50031044, CH50031045

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 fines; Sieve test on original material

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 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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Acc. NEN-EN 15149-2

Own method

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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

##### Method Code

eq. NEN-EN 15297

..

eq. NEN-EN 15297

cf NEN EN 15297

acc. NEN-15297

#### Other Analysis

##### Common

##### Method Description

##### Method Code

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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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