

Analytical Report

Energy Pellets Moerdijk BV

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

Reportnr. : **1042253 version 1**
Product recognized as : Hout/Wood/Bois/Holz/Madera
Product Specification : Woodpellets
Reference :
AWB / BarCode :
Packing : Plastic, ambient
Sample Type : BIS

Disponent Number : EPM. Woodpellets.6mm.01.2020

Sampling Date : 03-Feb-2020
Samplesize (kg) : 3,255
Sealed / Seal Code : No /
Sample Arrival Date : 04-Feb-2020 15:02
ReportDate Version : **10-Feb-2020 16:03**

Composition Determination

| Parameter | Result (as received) | Result (on dry) | Result (as det) | Result (dry ash free) | | | |
|---------------------------------|-------------------------|--------------------|--------------------|--------------------------|-------------|--|-----|
| Total Moisture | 7,02 | | | | % | | Q R |
| Moisture Airdry | | | 6,26 | | % | | Q R |
| Ash | 0,59 | 0,64 | 0,60 | | % | | Q R |
| Volatile matter incl. moisture. | | | 83,49 | | % | | Q R |
| Volatile matter | 76,60 | 82,38 | 77,22 | 82,91 | % | | |
| Fixed Carbon | 15,79 | 16,98 | | | % | | |
| Gross Calorific Value | 4438,8 | 4774,0 | 4475,1 | 4804,6 | kcal/kg | | Q R |
| | 18,58 | 19,99 | 18,74 | 20,12 | GJ/mt | | |
| Nett Calorific Value (cV) | 7989,9 | 8593,1 | 8055,2 | 8648,2 | B.T.U.'s/Lb | | |
| | 4130,4 | | | | kcal/kg | | Q |
| | 17,29 | | | | GJ/mt | | |
| | 7434,8 | | | | B.T.U.'s/Lb | | |
| | 4,8 | | | | kWh/kg | | |
| Nett Calorific Value (cP) | 17,22 | | | | GJ/mt | | Q |
| Emissionfactor CO2 (cV) | 101,80 | | | | t CO2/TJ | | |
| Emissionfactor CO2 (cP) | 102,30 | | | | t CO2/TJ | | |
| Hydrogen | 5,48 | 5,89 | 6,22 | 5,93 | % | | Q R |
| Carbon | 48,03 | 51,65 | 48,42 | 51,99 | % | | Q R |
| Nitrogen. | 0,20 | 0,22 | 0,21 | 0,22 | % | | Q R |
| S. (Sulfer) | 0,011 | 0,012 | 0,011 | 0,012 | % | | Q R |
| Oxygen (by difference) | | | | 41,850 | % | | |

Composition Determination

Common

| Parameter | Result (as received) | Result (on dry) | Result (as det) | | | |
|-------------------------|-------------------------|--------------------|--------------------|-------|--|-----|
| AFT. (oxid) DT | | | 1380 | gr. C | | R |
| Diameter pellets (n=25) | | | 6,0 | mm | | Q R |
| Length of pellets | | | 16,6 | mm | | Q R |
| Sieve < 3,15 mm. | | | < 0,1 | % | | R |

Metal and other elements

| Parameter | Result (as received) | Result (on dry) | Result (as det) | | | |
|--------------|-------------------------|--------------------|--------------------|-------|--|-----|
| Cd (Cadmium) | 0,096 | 0,103 | 0,097 | mg/kg | | Q R |
| Pb (Lead) | 2,34 | 2,52 | 2,36 | mg/kg | | Q R |

Demanded 04-Feb-2020 by Energy Pellets Moerdijk BV
Analyses according to annex
Drs. ing. H. Janssens Director TLR International Laboratories

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| | | | | | | |
|---------------|---------|---------|---------|-------|---|---|
| As (Arsenic) | 0,429 | 0,462 | 0,433 | 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) | 0,013 | 0,014 | 0,013 | % | Q | R |
| Cr.(Chromium) | < 5,0 | < 5,0 | < 5,0 | mg/kg | | R |
| Cu.(Copper) | 11,4 | 12,3 | 11,5 | mg/kg | | R |
| Zn. (Zinc) | 17,3 | 18,6 | 17,4 | mg/kg | | R |

Other Analysis

| Common Parameter | Result (as received) | Result (on dry) | Result (as det) | | | |
|-----------------------|----------------------|-----------------|-----------------|-------------------|---|---|
| H.L. weight | | | 621,0 | kg/m ³ | | R |
| Mechanical Durability | | | 98,3 | % | Q | R |

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

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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; 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-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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Own method

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Acc. NEN-EN-ISO17829

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Metal and other elements

Method Description

Determination of chloride (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

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Acc. NEN-EN-ISO16968

eq.nen-en-iso16968

Other Analysis

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Common

Method Description

Determination of mechanical durability of pellets

Method Code

NEN-EN-ISO 17831-1

Abbreviations:

acc: in accordance with

eq: Equivalent to

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