HAMILTON

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REPORT NO. 88/TCH/19/01

NAME AND ADDRESS OF CUSTOMER		COMMODITY **BIOMASS** Description: **Pellets Etna ENA1Plus**
SAMPLE RECEIPT DATE 15.05.2019	END DATE OF ANALYSIS 20.05.2019	SAMPLES TAKEN BY **Customer**

1. **Sample preparation in accordance with PN-EN 14780:2011**
2. **Results of analysis no: 224775/19/TCH**

Parameter	Method	Result
Total moisture content (W_t^r)	PN-EN ISO 18134-2:2017-03*	7,0 %
Moisture content in analytical state (W^a)	PB-98 wyd. III z dn. 21.05.2013*	4,43 %
Ash in operational state (A^r)	PN-EN ISO 18122:2016-01*	0,4 %
Ash in analytical state (A^a)	PN-EN ISO 18122:2016-01*	0,4 %
Sulphur in operational state (S_t^r)	PN-EN ISO 16994:2016-10*	<0,02 %
Sulphur in analytical state (St^a)	PN-EN ISO 16994:2016-10*	<0,02 %
Hydrogen in operational state (H_t^r)	PN-EN ISO 16948:2015-07*	5,8%
Hydrogen in analytical state (H_t^a)	PN-EN ISO 16948:2015-07*	5,9%
Carbon in operational state (C_t^r)	PN-EN ISO 16948:2015-07*	48,1%
Carbon in analytical state (C_t^a)	PN-EN ISO 16948:2015-07*	49,4%
Chlorine in operational state (Cl^r)	PB-86 wyd. I z dn. 17.06.2009^N	<0,01%
Chlorine in analytical state (Cl^a)	PB-86 wyd. I z dn. 17.06.2009^N	<0,01%
Net calorific value in operational state (Q_i^r)	PN-EN ISO 18125:2017-07$^{2)}$**	17755 kJ/kg
Net calorific value in operational state (Q_i^r)	PN-EN ISO 18125:2017-07$^{2)}$**	4241 kcal/kg
Net calorific value in analytical state (Q_i^a)	PN-EN ISO 18125:2017-07$^{2)}$**	18313 kJ/kg
Net calorific value in analytical state (Q_i^a)	PN-EN ISO 18125:2017-07$^{2)}$**	4374 kcal/kg

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Parameter	Method	Result
Gross calorific value in operational state (Q_s^r)	PN-EN ISO 18125:2017-07[1)]**	19180 kJ/kg
Gross calorific value in operational state (Q_s^r)	PN-EN ISO 18125:2017-07[1)]**	4581 kcal/kg
Gross calorific value in analytical state (Q_s^a)	PN-EN ISO 18125:2017-07[1)]**	19710 kJ/kg
Gross calorific value in analytical state (Q_s^a)	PN-EN ISO 18125:2017-07[1)]**	4708 kcal/kg

Results refer to analysed sample only.
Above mentioned analyses apart from analysis of chlorine content performed by the J.S. Hamilton Poland Sp. z o.o.testing Laboratory in Tychy accredited in this scope by PCA, no AB 079
[N] Above mentioned method of analysis performed by the J.S. Hamilton Poland Sp. z o.o.testing Laboratory in Tychy beyond its accreditaton scope by PCA
* accredited results of analyses
** not accredited results of analyses

[1)]in the process of estimating gross calorific value, sulphur content determined as part of analysis together with calculated correction of nitrogen value obtained while titration of the residue of combustion
[2)]in the process of estimating net calorific value, hydrogen and sulphur content determined as part of analysis together with calculated correction of oxygen and nitrogen value in accordance with PN-EN ISO 18125 :2017-07 art. 12.2

J. S. Hamilton Poland Sp. z o.o. provide their services in accordance with „General Conditions for Providing Services" that are available on website www.hamilton.com.pl

Tychy, 20.05.2019

Starszy specjalista
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