



REF No. 1011162
Hochiminh City, 24 Dec, 2020

REPORT OF ANALYSIS

Client name: **CONG TY TNHH BIOMASS FUEL VIET NAM**

SAMPLE DESCRIPTION:

Goods described as: **WOOD PELLET**
Date of testing: 17 Dec, 2020
All test was completed on: 24 Dec, 2020
Test Requested: Chemical testing
Place of Intervention: SGS Laboratory

TEST RESULTS:

Test items	Test methods	MDL	Results
Durability, As received basis	ISO 17831-1:2015	-	97.70 %
Total Moisture, As received basis	ISO 17134-2:2017	-	3.95 %
Moisture in the analysis sample	ISO 18134-3:2015	-	4.23 %
Ash, Air dry basis	ISO18122:2015	-	0.96 %
Sulfur, Air dry basis	ISO 16994:2016	-	0.027 %
Sulfur, Dry basis	ISO 16994:2016	-	0.028 %
Gross Calorific value, As received basis	ISO 18125:2017	-	4621 kcal/kg
Gross Calorific value, Air dry basis	ISO 18125:2017	-	4607 kcal/kg
Net Calorific Value, As-received basis @Constant Volume	ISO 18125:2017	-	4318 kcal/kg
Volatile Matter, Air dry basis	ISO 18123:2015	-	78.81 %
Fixed carbon (by diff), Air dry basis	Calculated	-	16.00 %
Carbon, Dry basis	ISO 16948:2015	-	50.66 %
Carbon, DAF	ISO 16948:2015	-	51.17 %
Hydrogen, Air dry basis (Include H in moisture)	ISO 16948:2015	-	6.18 %
Nitrogen, Air dry basis	ISO 16948:2015	-	0.23 %
Oxygen (by diff), Dry basis, (Exclude O in moisture)	ISO 16993:2016	-	42.07 %
Diameter	ISO 17829:2015	-	8.02 mm
Length	ISO 17829:2015	-	21.28 mm
Bulk Density, As received basis	ISO 17828:2015	-	699 kg/m3
Deformation Temp., DT - Reducing atm	ISO 21404:2020	-	1162 °C
Hemisphere Temp., HT - Reducing atm		-	1242 °C
Flow Temp., FT - Reducing atm		-	1250 °C
Deformation Temp., DT - Oxidizing atm		-	1192 °C

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Hemisphere Temp., HT - Oxidizing atm		-	1243 °C
Flow Temp., FT - Oxidizing atm		-	1251 °C
Fines			
<3.15mm	ISO 18846:2016	-	0.45 %
Particles Size			
<3.15mm	ISO 17830:2016	-	99.71 %
<2.0mm	ISO 17830:2016	-	97.07 %
<1.0mm	ISO 17830:2016	-	77.34 %
<0.6mm	ISO 17830:2016	-	50.34 %
Particles Size Distribution			
D98	QUNH-TST-SOP-8018	-	2.00 mm
D50		-	0.58 mm
Chlorine (Cl)_ Dry in BIOF	ISO 16994:2016 & ISO 10304-1:2007	-	461.97 mg/kg
SiO ₂ in Ash, Dry	ISO 16967:2015	-	39.8 %
Al ₂ O ₃ in Ash, Dry	ISO 16967:2015	-	4.5 %
Fe ₂ O ₃ in Ash, Dry	ISO 16967:2015	-	7.88 %
CaO in Ash, Dry	ISO 16967:2015	-	20.25 %
MgO in Ash, Dry	ISO 16967:2015	-	3.12 %
TiO ₂ in Ash, Dry	ISO 16967:2015	-	0.25 %
Na ₂ O in Ash, Dry	ISO 16967:2015	-	2.345 %
K ₂ O in Ash, Dry	ISO 16967:2015	-	9.295 %
P ₂ O ₅ in Ash, Dry	ISO 16967:2015	-	1.66 %
SO ₃ in Ash, Dry	ASTM D5016-16	-	1.395 %
MnO in Ash	BS EN 15411:2011	-	0.895 %
Mn ₃ O ₄ in Ash	BS EN 15411:2011	-	0.615 %
BaO in Ash	BS EN 15411:2011	-	0.116 %
ZnO in Ash	BS EN 15411:2011	-	0.083 %
V ₂ O ₅ in Ash	BS EN 15411:2011	-	0.005 %
F, dry	CEN/TS 15408:2006	2 mg/kg	Not detected
B, dry	ISO 23380:2013	2 mg/kg	Not detected
Hg, dry	ISO 15237:2016	2 mg/kg	Not detected
Se, dry	BS EN 15411:2011	2 mg/kg	Not detected
As, dry	BS EN 15411:2011	2 mg/kg	Not detected
Cd, dry	BS EN 15411:2011	2 mg/kg	Not detected
Cr, dry	BS EN 15411:2011	2 mg/kg	Not detected
Cu, dry	BS EN 15411:2011	2 mg/kg	Not detected
Pb, dry	BS EN 15411:2011	2 mg/kg	Not detected
Ni, dry	BS EN 15411:2011	2 mg/kg	Not detected
Zn, dry	BS EN 15411:2011	-	6.70 mg/kg
Na, dry	ISO 16967:2015	-	175.70 mg/kg
K, dry	ISO 16967:2015	-	779.08 mg/kg
Na + K	-	-	954.78 mg/kg

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Al, dry	ISO 16967:2015	-	240.60 mg/kg
Ca, dry	ISO 16967:2015	-	1461.94 mg/kg
Mg, dry	ISO 16967:2015	-	189.07 mg/kg
P, dry	ISO 16967:2015	-	73.20 mg/kg
Foreign Matter			
Foreign Material other than wood in the sample and is visually checked without disintegrating the pellet such as gravel, rock, metal, plastic, etc.	QUNH-TST-SOP-8037	-	Not detected

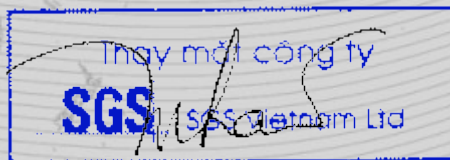
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“This report cancels and supersedes the report No.21010403AB dated 24 Dec 2020 issued by SGS Vietnam Ltd.”

REPORT RESULTS REFER TO SUBMITTED SAMPLE(S) ONLY

*** END OF THE REPORT ***

Signed for and on behalf of
SGS Vietnam LTD.
 Bui Phan Truong Trong Nhan



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