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INTERNATIONAL INSPECTION & SURVEYING
INSPECTIONS REQUIRED BY REGULATIONS FOR
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ORIGINAL

(Ref. MK)

Analysis Certificate

YOKOHAMA

Date : Feb. 14, 2025

Certificate No. MCO 569/24

THIS IS TO CERTIFY THAT the under mentioned sample was analyzed by us with the following results:

Applicant : SSGE BIO-ENERGY CO.,LTD.
Description of Sample : EFB Torrefied Pellet
Sample submitted by : The applicant
Remarks : None

Result of Analysis:

1. Moisture	As received basis (%)	Test method
Total Moisture	2.9	ISO 18134-1

2. Proximate Analysis	As received basis (%)	Air dried basis (%)	Dry basis (%)	Test method
Inherent Moisture		3.1		ISO 18134-3
Ash@550 deg C	2.7		2.8	ISO 18122
Volatile Matter	72.9		75.0	ISO 18123
Fixed Carbon	21.5		22.2	ISO 17225-1

3. Calorific Value	As received basis	Dry basis	Test method
Gross Calorific Value (J/g)	20,680	21,300	ISO 18125
Net Calorific Value @Constant Pressure (J/g)	19,400	20,050	
Gross Calorific Value (cal/g)	4,940	5,090	
Net Calorific Value @Constant Pressure (cal/g)	4,630	4,790	

4. Ultimate Analysis	Dry basis (%)	Test method
Carbon	52.8	ISO 16948
Hydrogen	5.73	
Nitrogen	0.48	
Total Sulfur	0.06	ISO 16994
Total Chlorine	0.003	
Oxygen	38.13	ISO 16993

Oxygen (Dry basis) = 100 - Carbon - Hydrogen - Nitrogen - Total Sulfur - Total Chlorine - Ash@550 deg C

This Certificate/Report contains measures to prevent forgery. If you have any question regarding the contents, please refer to the Original of the Certificate/Report.
This survey/inspection has been conducted under the quality management systems conforming to ISO9001/ISO9001 registered by ClassNK, which is accredited by JAB(Japan Accreditation Board).

5. Trace element	Dry basis (mg/kg)	Test method
Na (Sodium)	210	ISO 16967 mod.
K (Potassium)	1,300	
As (Arsenic)	0.1	ISO 16968 mod.
Pb (Lead)	Less than 10	
Total Hg (Total Mercury)	Less than 0.01	
Cd (Cadmium)	Less than 0.5	
Cu (Copper)	Less than 10	
Zn (Zinc)	30	
Ni (Nickel)	Less than 10	

6. Composition of Ash @550°C	Result (%)	Test method
SiO ₂	53.53	ISO 16967 mod.
Al ₂ O ₃	3.78	
Fe ₂ O ₃	7.89	
CaO	9.10	
MgO	8.60	
Na ₂ O	0.99	
K ₂ O	5.21	

7. Fusibility Temperature of Ash @550 deg C (Reducing atmosphere)	Result (°C)	Test method
Shrinkage starting temperature	1,110	ISO 21404 Ash preparation temperature : 550°C
Deformation temperature	1,160	
Hemisphere temperature	1,200	
Flow temperature	1,210	

8. Physical and Mechanical test	As received basis	Test method
Bulk density (kg/m ³)	670	ISO 17828
Fines content (%)	0.4	ISO 5370
Mechanical durability (%)	94.7	ISO 17831-1
Water sorption (W _{sorp}) (%)	13.7	ISO 23343-1
Post-immersion durability reduction (DUR _{pi}) (%)	0.1	
H.G.I.	29 ^{*1}	JIS M8801
T.T.B.G.I.	50 ^{*1}	Calculation

T.T.B.G.I. = $0.8239 \times m_1 \div (m_1 + m_2) \times 100 + 0.5052$; Analysis method specified by the applicant.

m_1 is the total mass of the sieving fraction below 500 µm in g

m_2 is the total mass of the sieving fraction above 500 µm in g.

(Last Item)

^{*1} Reference

For all enquiries, Please call : 045-772-1521



NIPPON KAIJI KENTEI KYOKAI


M. ISHIDA, PRESIDENT