Palm Kernel Shell Specification

BUREAU VERITAS

REPORT OF ANALYSIS

Customer : PT. KEUSUMA ADIKARA JAYA ENERGY
Report No : IDPLM-25-00170.1
Received Date : JULY 14, 2025
Ref. No. : OC-066/IOL-PLB/VII/25
Standard Method : ASTM

Sample Code				Palm Kernel Shell (PKS)
Analyses	Standard Method	Unit	Basis	Result
Total Moisture	ASTM D3302 / D3302M - 22A	%	arb	11.35
Inherent Moisture	ASTM D3173/D3173M-17a	%	adb	8.61
Ash Content	ASTM D3174-12 (R2018)e1	%	adb	0.82
Volatile Matter	ASTM D3175-20	%	adb	72.64
Fixed Carbon	ASTM D3172 - 13(2021)e1	%	adb	17.93
Total Sulfur	ASTM D4239-18e1 Metode A	%	adb	0.07
Gross Calorific Value	ASTM D5865-2019	cal/g	adb	4813
Gross Calorific Value	ASTM D5865-2019	cal/g	arb	4669
Net Calorific Value	ASTM D5865-2019	cal/g	arb	4317
Chlorine	ASTM D4208-19	%	adb	0.02
Chlorine	ASTM D4208-19	ppm	adb	182
Bulk Density Uncompacted	ASTM D291/291M - 20	Kg/m3	-	545.00
Bulk Density Compacted	ASTM D291/291M - 20	Kg/m3	-	605.00

Note : arb = as received basis ; adb = air dried basis ; db = dry basis

Sample Code				Palm Kernel Shell (PKS)
Analyses	Standard Method	Unit	Basis	Result
ULTIMATE				
Carbon	ASTM D5373-21 Metode A	%	adb	50.0
Hydrogen	ASTM D5373-21 Metode A	%	adb	5.67
Nitrogen	ASTM D5373-21 Metode A	%	adb	0.34
Oxygen	ASTM D5373-21 Metode A	%	adb	34.49
ASH ANALYSIS				
Na2O	ASTM D3682-01(2021)	%	db	0.39
K2O	ASTM D3682-01(2021)	%	db	6.47
SIZE ANALYSIS				
Above 3.15 mm	ASTM D4749-87(2019)e1	%		99.70
Above 1.00 mm	ASTM D4749-87(2019)e1	%		0.10
Under 1.00 mm	ASTM D4749-87(2019)e1	%		0.20

Note : arb = as received basis ; adb = air dried basis ; db = dry basis

Palm Kernel Charcoal Specification

BUREAU VERITAS

REPORT OF ANALYSIS

Customer : PT. KEUSUMA ADIKARA JAYA ENERGY
Report No : IDPLM-25-00170.2
Received Date : JULY 14, 2025
Ref. No. : OC-066/IOL-PLB/VII/25
Standard Method : ASTM

Sample Code				Palm Kernel Shell Charcoal (PKSC) with Fix Carbon Below 75%
Analyses	Standard Method	Unit	Basis	Result
Total Moisture	ASTM D3302 / D3302M - 22A	%	arb	6.94
Inherent Moisture	ASTM D3173/D3173M-17a	%	adb	5.43
Ash Content	ASTM D3174-12 (R2018)e1	%	adb	4.48
Volatile Matter	ASTM D3175-20	%	adb	20.98
Fixed Carbon	ASTM D3172 - 13(2021)e1	%	adb	69.11
Total Sulfur	ASTM D4239-18e1 Metode A	%	adb	0.10
Gross Calorific Value	ASTM D5865-2019	cal/g	adb	6903
Gross Calorific Value	ASTM D5865-2019	cal/g	arb	6793
Net Calorific Value	ASTM D5865-2019	cal/g	arb	6573
Chlorine	ASTM D4208-19	%	adb	0.03
Chlorine	ASTM D4208-19	ppm	adb	269
Bulk Density Uncompacted	ASTM D291/291M - 20	Kg/m3	-	556.50
Bulk Density Compacted	ASTM D291/291M - 20	Kg/m3	-	635.00

Note : arb = as received basis ; adb = air dried basis ; db = dry basis

Sample Code				Palm Kernel Shell Charcoal (PKSC) with Fix Carbon Below 75%
Analyses	Standard Method	Unit	Basis	Result
ULTIMATE				
Carbon	ASTM D5373-21 Metode A	%	adb	76.5
Hydrogen	ASTM D5373-21 Metode A	%	adb	3.54
Nitrogen	ASTM D5373-21 Metode A	%	adb	0.81
Oxygen	ASTM D5373-21 Metode A	%	adb	9.14
ASH ANALYSIS				
Na2O	ASTM D3682-01(2021)	%	db	0.61
K2O	ASTM D3682-01(2021)	%	db	5.77
SIZE ANALYSIS				
Above 3.15 mm	ASTM D4749-87(2019)e1	%		91.80
Above 1.00 mm	ASTM D4749-87(2019)e1	%		7.70
Under 1.00 mm	ASTM D4749-87(2019)e1	%		0.50

Note : arb = as received basis ; adb = air dried basis ; db = dry basis

Wood Pellet Specification

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BUREAU VERITAS

CERTIFICATE OF ANALYSIS

Report No. : 22-1-250115
Job No. : IDJKO-25-00168
Date of report : July 3, 2024
Date of analysis : July 1-3, 2025

The following is a laboratory analysis report of one (1) bag sample of Wood Pellet received on July 1, 2025.

The sample in packaging and marked as follows :

Shipper : PT. KEUSUMA ADIKARA JAYA ENERGY
Sample : WOOD PELLET

PARAMETERS	STANDARD	UNIT	BASIS	RESULT
A. Total Moisture	ASTM D3302 / D3302M - 22A	Weight %	ARB	4.01
B. Inherent Moisture	ASTM D3173/D3173M-17a	Weight %	ADB	4.01
C. Ash Content	ASTM D3174-12 (R2018)e1	Weight %	ADB	0.82
D. Volatile Matter	ASTM D3175-20	Weight %	ADB	79.06
E. Fixed Carbon	ASTM D3172 - 13(2021)e1	Weight %	ADB	16.11
F. Total Sulfur	ASTM D4239-18e1 Metode A	Weight %	DB	0.05
G. Carbon	ASTM D5373-21 Metode A	Weight %	ADB	47.40
H. Hydrogen	ASTM D5373-21 Metode A	Weight %	ADB	5.87
I. Nitrogen	ASTM D5373-21 Metode A	Weight %	ADB	1.68
J. Oxygen	ASTM D5373-21 Metode A	Weight %	ADB	40.17
K. Gross Calorific Value	ASTM D5865-2019	cal/g	DB	4,613
L. Gross Calorific Value	ASTM D5865-2019	cal/g	ARB	4,428
M. Net Calorific Value	ASTM D5865-2019	cal/g	ARB	4,103
N. Bulk Density	ASTM D291/291M - 20	Kg/m3	-	628.66

Note
ARB: As Received Basis; ADB: Air Dried Basis; DB: Dried Basis
Remarks: This Report refers to the tested sample only

This Report Reflects our finding at time and places of analysis only and does not report any others matters.

This Report is issued without prejudice and our responsibility is limited to the exercise or reasonable care and due diligence.

PT. IOL INDONESIA,
JAKARTA

Andi Supriyadi
Business Development & Operation Manager for Renewable Fuel
JKT0707025