

CERTIFICATE OF SAMPLING AND ANALYSIS OF SHIPMENT OF COAL

Page 1/2

Certificate No.:	201907-176 1	Date:	24/07/2019
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A Cargo of 76808 metric tons of coal described by the Exporter as
STEAM COAL NON COKING IN BULK OF SOUTH AFRICAN ORIGIN
was loaded at the Richards Bay Coal Terminal, South Africa between
17/07/2019 and 18/07/2019 on board the
MV KMAX EVDOKIA

This is to certify that the coal was mechanically sampled in accordance to ISO 13909-2, prepared in accordance
with ISO 13909-4 and tested by SGS SOUTH AFRICA (PTY) LTD in accordance with the relevant standard methods.
The following results are the weighted average of the individual samples. Issued at loading port.

ISO Analysis

Analysis	Units	Methods	As Received	Air Dry	Dry Basis
Gross Calorific Value	MJ/kg	ISO 1928	21.11	22.00	22.70
Gross Calorific Value	kcal/kg	ISO 1928	5042	5254	5422
Gross Calorific Value	Btu/lb	ISO 1928	9076	9457	9759
Net Calorific Value constant volume	MJ/kg	ISO 1928	20.35	21.30	22.05
Net Calorific Value constant volume	kcal/kg	ISO 1928	4860	5087	5267
Total Moisture	%	ISO 589 (B2)	7.0		
Moisture in Analysis Sample	%	ISO 11722		3.1	
Ash	%	ISO 1171	26.4	27.5	28.4
Volatile Matter	%	ISO 562	20.1	20.9	21.6
Fixed Carbon	%	ISO 17246	46.5	48.5	50.0
			100.0	100.0	100.0
Total Sulphur	%	ISO 19579	0.84	0.88	0.91
Hydrogen in coal	%	ISO 29541	2.93	3.05	3.15
Chlorine in coal	%	ASTM D4208	0.0038	0.0040	0.0041
Hardgrove Grindability Index		ISO 5074		67	
Fusibility of Ash (Reducing):					
Deformation temperature, DT	°C	ISO 540			1340
Sphere temperature, ST	°C	ISO 540			1370
Hemisphere temperature, H _T	°C	ISO 540			1400
Flow temperature, FT	°C	ISO 540			1430
Nominal Topsize 50 mm					

RESULTS REPORTED RELATE ONLY TO ITEMS TESTED

Issued at Loading Port By
SGS South Africa (Pty) Ltd

Technical Signatory

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Page 2/2

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Ash Constituents (Dry)			
Silicon Dioxide (SiO ₂)	%	ASTM D3682	51.98
Aluminium Oxide (Al ₂ O ₃)	%	ASTM D3682	29.11
Ferrous Oxide (Fe ₂ O ₃)	%	ASTM D3682	4.61
Calcium Oxide (CaO)	%	ASTM D3682	6.33
Magnesium Oxide (MgO)	%	ASTM D3682	1.72
Titanium Dioxide (TiO ₂)	%	ASTM D3682	1.58
Potassium Oxide (K ₂ O)	%	ASTM D3682	0.59
Sodium Oxide (Na ₂ O)	%	ASTM D3682	0.07
Sulphur Trioxide (SO ₃)	%	ASTM D5016	2.25
Phosphorous Pentoxide (P ₂ O ₅)	%	BS 1016 : Part 14	0.85

Ultimate Analysis (Dry)			
Carbon	%	ISO 29541	57.9
Hydrogen	%	ISO 29541	3.15
Nitrogen	%	ISO 29541	1.41
Sulphur	%	ISO 19579	0.91
Ash	%	ISO 1171	28.38
Oxygen (By Difference)	%	ISO 17246	8.25

Nominal Topsize 50 mm

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Issued at Loading Port By
SGS South Africa (Pty) Ltd



10738

All services are rendered in accordance with SGS General Terms and Conditions of Business available on request at <http://www.sgs.com/terms and conditions>

[Signature]
Technical Signatory