

Bureau Veritas Inspectorate Laboratories (Pty) Ltd  
 Richards Bay Harbour  
 South Dunes  
 Richards Bay  
 3900  
 South Africa  
 T: +27 35 7977010/1  
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INSPECTORATE

## CERTIFICATE OF SAMPLING AND ANALYSIS OF SHIPMENT OF COAL

Certificate No. :

A cargo of 85015 metric tons of coal described by the Exporter as  
**STEAM COAL**  
 was loaded at the Richards Bay Coal Terminal, South Africa between                      and                      on board the

This is to certify that the coal was mechanically sampled in accordance with ISO 13909-2:2001,  
 prepared in accordance with ISO 13909-4:2001 and tested by Bureau Veritas Inspectorate 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
Gross Calorific Value	MJ/kg	ISO 1928:2009	25.75	27.00	27.81
Gross Calorific Value	kcal/kg	ISO 1928:2009	6150	6449	6642
Gross Calorific Value	Btu/lb	ISO 1928:2009	11071	11608	11956
Net Calorific Value constant volume	MJ/kg	ISO 1928:2009	24.85	26.17	27.02
Net Calorific Value constant volume	kcal/kg	ISO 1928:2009	5936 ✓	6251	6455
Total Moisture	%	ISO 589:2008(B2)	7.4 ✓		
Moisture in Analysis Sample	%	ISO 11722:1999		2.9	
Ash	%	ISO 1171:2010	15.4 ✓	16.1	16.6
Volatile Matter	%	ISO 562:2010	22.7 ✓	23.8	24.5
Fixed Carbon	%	ASTM D3172-07a	54.5	57.2	58.9
			100.0	100.0	100.0
Total Sulphur	%	ISO 19579:2006	0.58 ✓	0.61	0.63
Hydrogen in coal	%	ISO 29541:2010	3.53	3.70	3.81
Chlorine in coal	%	ASTM D4208-02	0.004	0.004	0.004
Hardgrove Grindability Index		ISO 5074:1994		52 ✓	
Fusibility of ash (Reducing):					
Deformation temperature, DT	°C	ISO 540:2008			1440
Sphere temperature, ST	°C	ISO 540:2008			1470
Hemisphere temperature, HT	°C	ISO 540:2008			1480
Flow temperature, FT	°C	ISO 540:2008			+1500
Nonfines Topsize 50mm					

RESULTS REPORTED RELATE ONLY TO ITEMS TESTED

Issued at Loading Port By  
 Bureau Veritas Inspectorate Laboratories (Pty) Ltd;

*Adinga*  
 Technical Signatory



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## CERTIFICATE OF SAMPLING AND ANALYSIS OF SHIPMENT OF COAL

Certificate No. :

A cargo of 73800 metric tons of coal described by the Exporter as  
**STEAM COAL IN BULK**  
 was loaded at the Richards Bay Coal Terminal, South Africa between                      and                      on board the

This is to certify that the coal was mechanically sampled in accordance with ISO 13909-2:2001,  
 prepared in accordance with ISO 13909-4:2001 and tested by Bureau Veritas Inspectorate in accordance with the relevant standard methods.  
 The following results are the weighted average of the individual samples.  
 Issued at loading port.

### ISO Analysis

Analyses	Units	Methods	As Received	Air Dry	Dry
Gross Calorific Value	MJ/kg	ISO 1928:2009	25.84	27.09	27.87
Gross Calorific Value	kcal/kg	ISO 1928:2009	6172	6470	6657
Gross Calorific Value	Btu/lb	ISO 1928:2009	11109	11647	11982
Net Calorific Value constant volume	MJ/kg	ISO 1928:2009	24.96	26.28	27.11
Net Calorific Value constant volume	kcal/kg	ISO 1928:2009	5962	6278	6475
Total Moisture	%	ISO 589:2008(B2)	7.3		
Moisture in Analysis Sample	%	ISO 11722:1999		2.8	
Ash	%	ISO 1171:2010	15.3	16.0	16.5
Volatile Matter	%	ISO 562:2010	23.2	24.3	25.0
Fixed Carbon	%	ASTM D3172-07a	54.2	56.9	58.5
			100.0	100.0	100.0
Total Sulphur	%	ISO 19579:2006	0.62	0.65	0.67
Hydrogen in coal	%	ISO 29541:2010	3.42	3.59	3.69
Chlorine in coal	%	ASTM D4208-02	0.006	0.006	0.006
Hardgrove Grindability Index		ISO 5074:1994		52	
Fusibility of ash (Reducing):					
Deformation temperature, DT	°C	ISO 540:2008			1450
Sphere temperature, ST	°C	ISO 540:2008			1470
Hemisphere temperature, HT	°C	ISO 540:2008			1490
Flow temperature, FT	°C	ISO 540:2008			+1500
Nominal Topsize 50mm					

RESULTS REPORTED RELATE ONLY TO ITEMS TESTED

Issued at Loading Port By  
 Bureau Veritas Inspectorate Laboratories (Pty) Ltd:

*Dunge*  
 Technical Signatory



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