



ALEX STEWART LABORATORY (M) SDN BHD

(Your Global Network Of Inspection & Analytical Laboratory Services)

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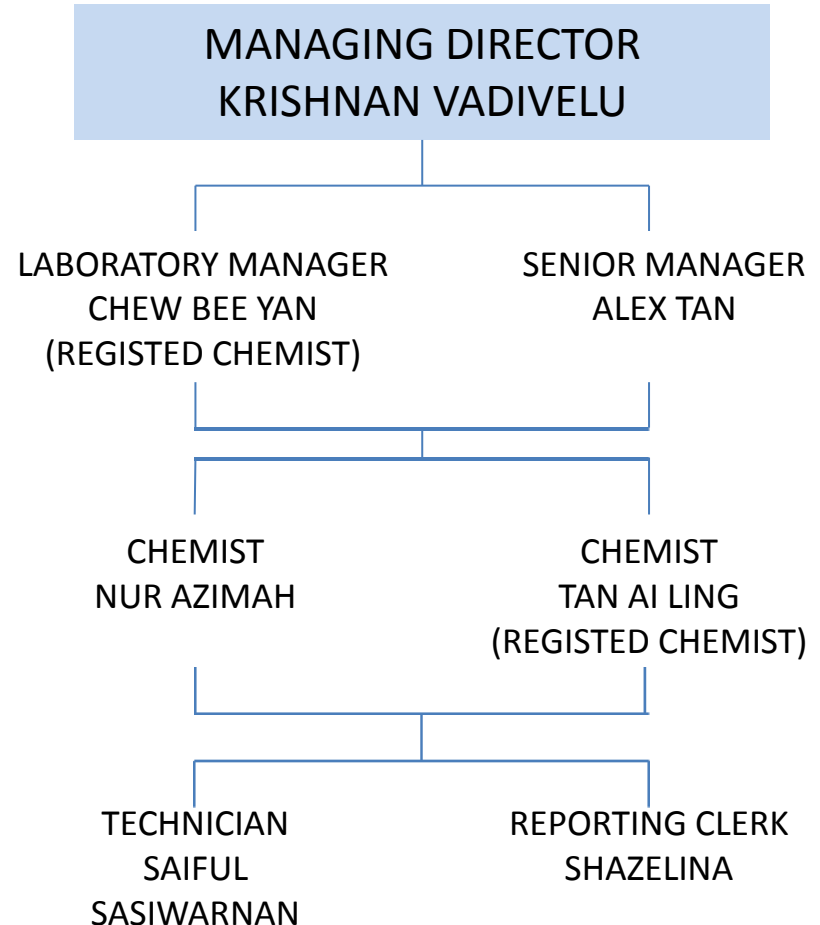




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LABORATORY ORGANIZATION





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Our laboratory facilities are capable in performing coal and sugar analysis.

COAL ANALYSIS

1. Total Moisture
2. Inherent Moisture
3. Gross Calorific Value
4. Ash
5. Volatile Matter
6. Fixed Carbon
7. Sulphur
8. Carbon
9. Nitrogen
10. Hydrogen
11. Oxygen
12. Hardgrove Grindability Index



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SUGAR ANALYSIS

1. Colour
2. Moisture / Loss On Drying
3. Polarisation
4. Brix





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Facilities

in Alex Stewart

Laboratory (M)

Sdn Bhd



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Coal Analysis

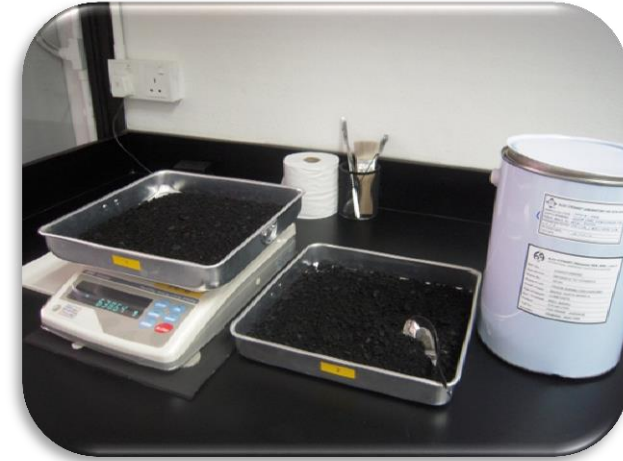
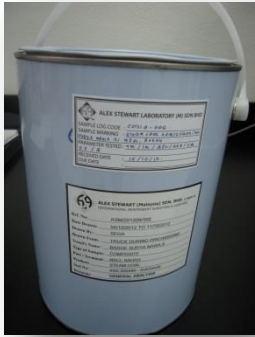




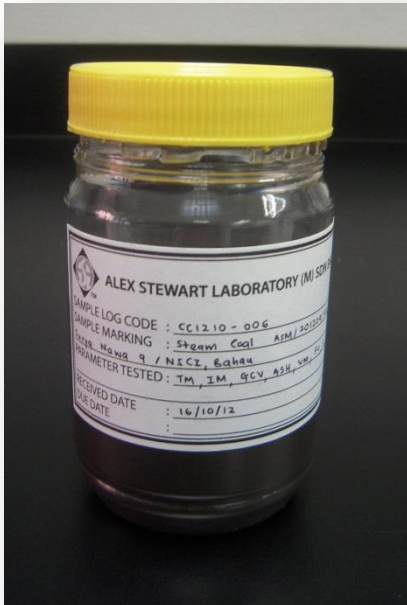
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Sample Preparation



Air drying process

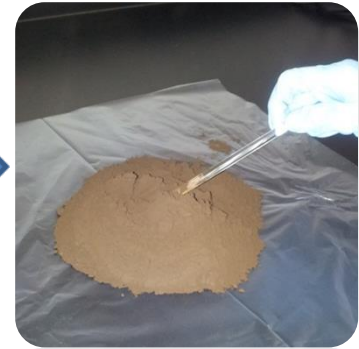


Sample is pulverized to below 250 μ m

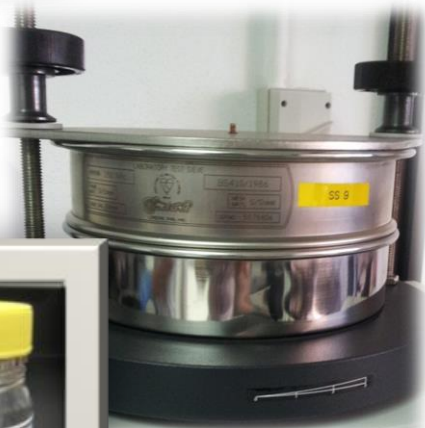
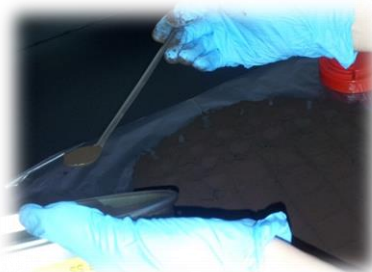


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Incremental Subsampling



Sample is sieved through 250µm





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Total Moisture





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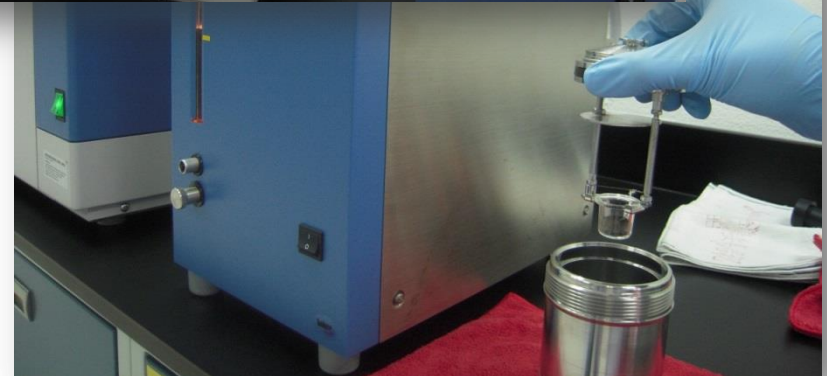
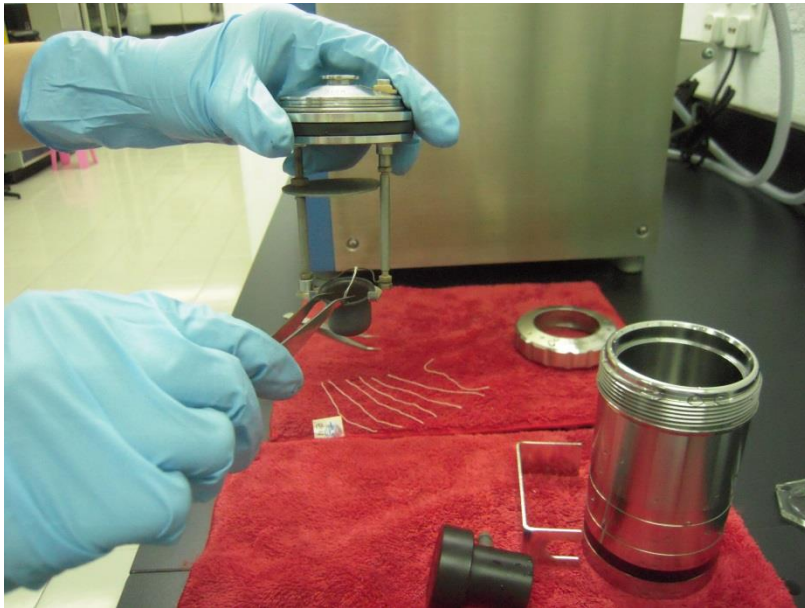
Inherent Moisture / Residue Moisture





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Gross Calorific Value



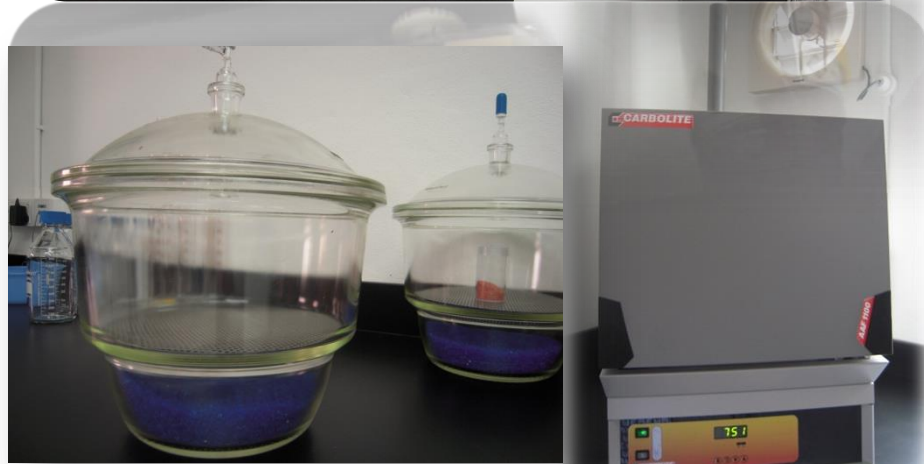
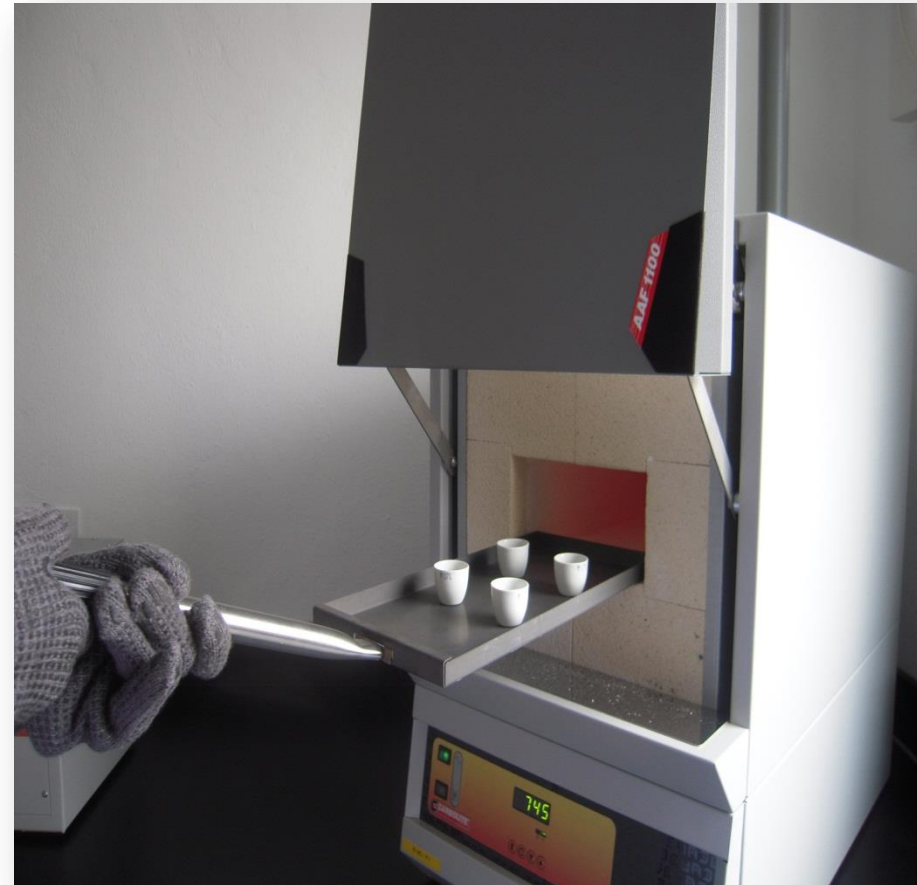


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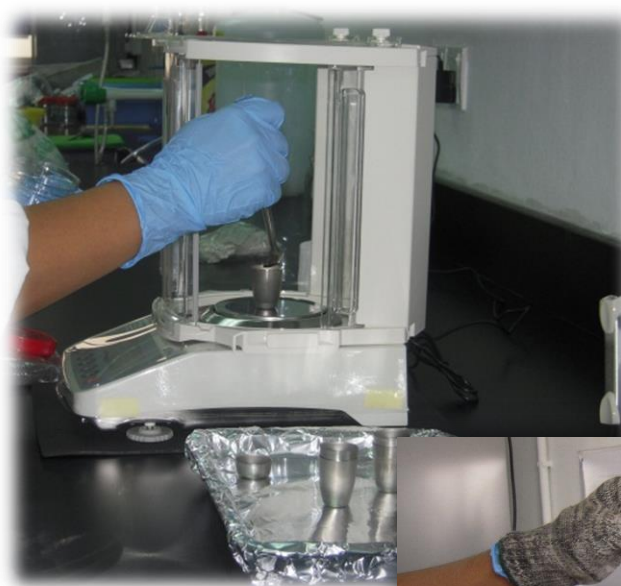
Ash





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Volatile Matter





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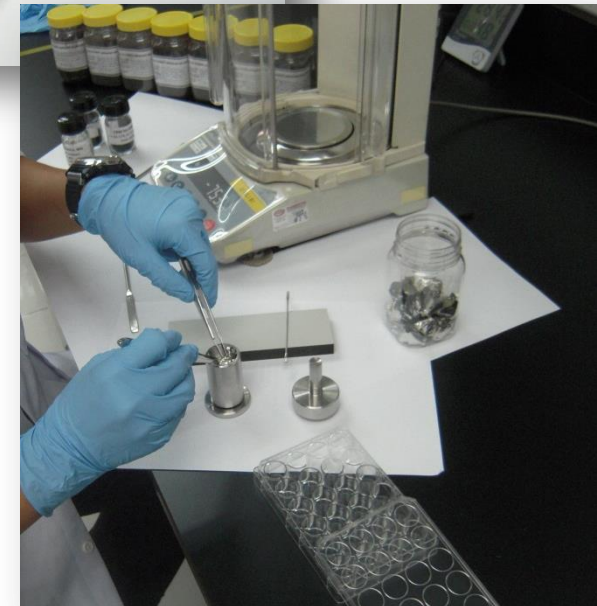
Hardgrove Grindability Index





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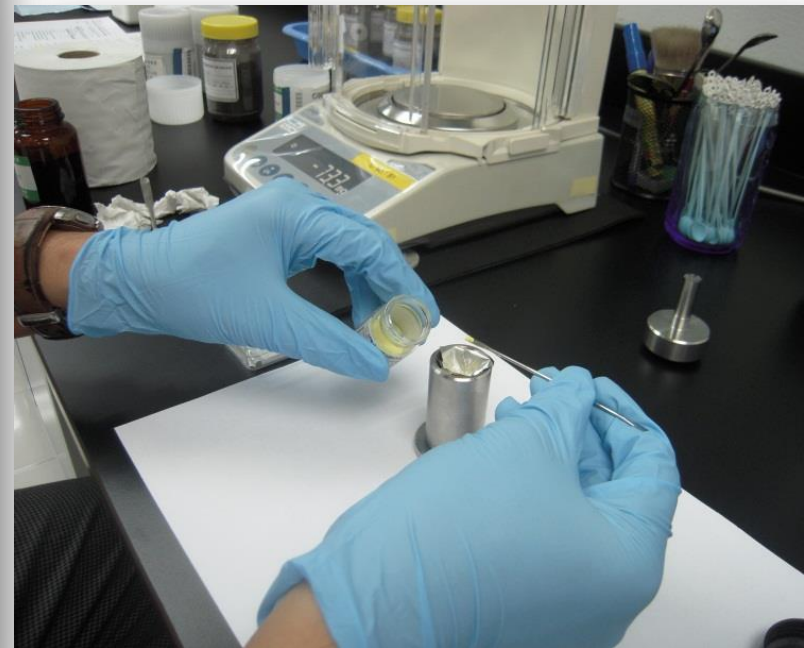
Carbon, Hydrogen & Nitrogen





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Sulphur





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Sugar Analysis





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Colour





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Moisture / Loss On Drying





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Polarisation





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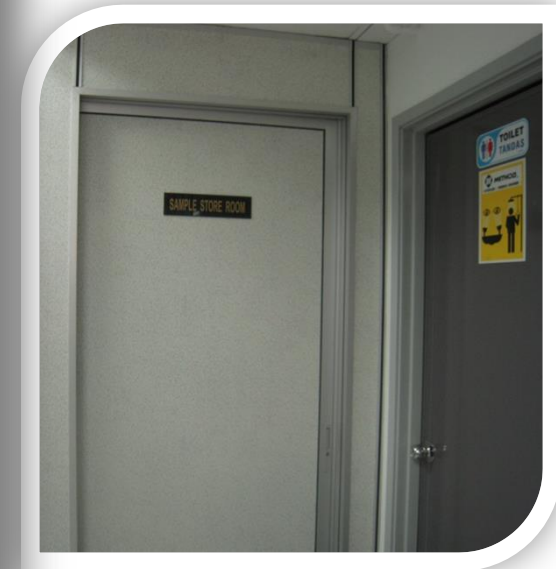


Brix



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Sample Store Room





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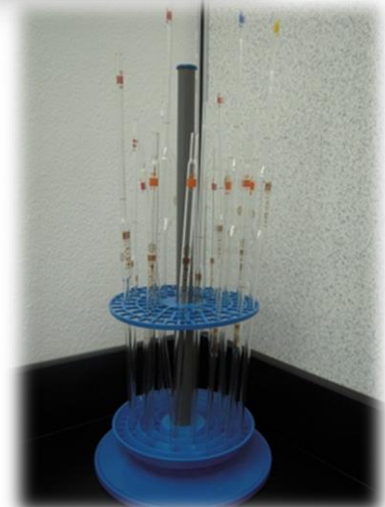
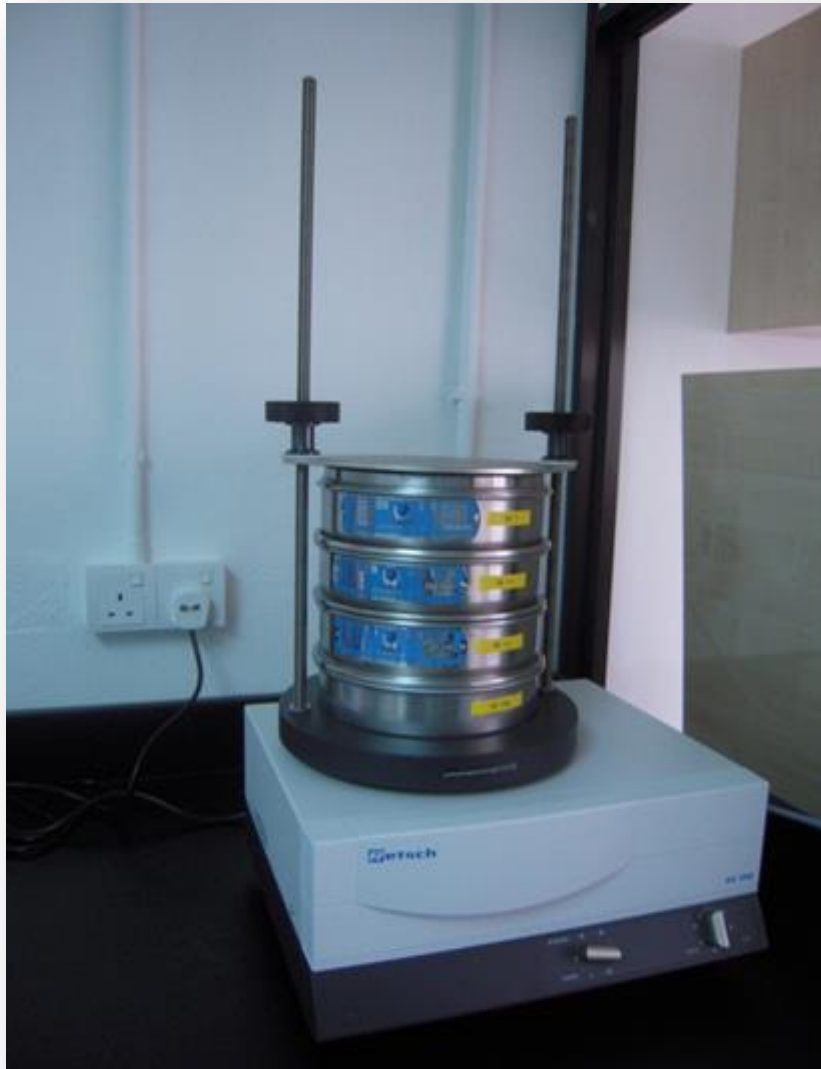
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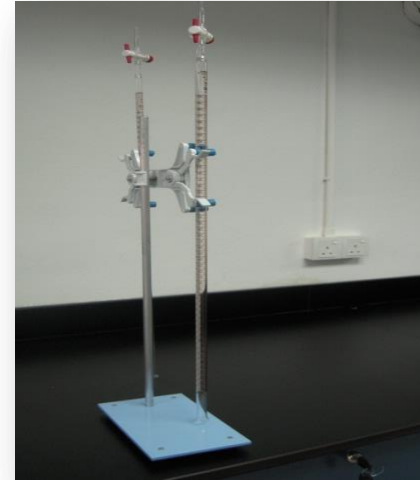
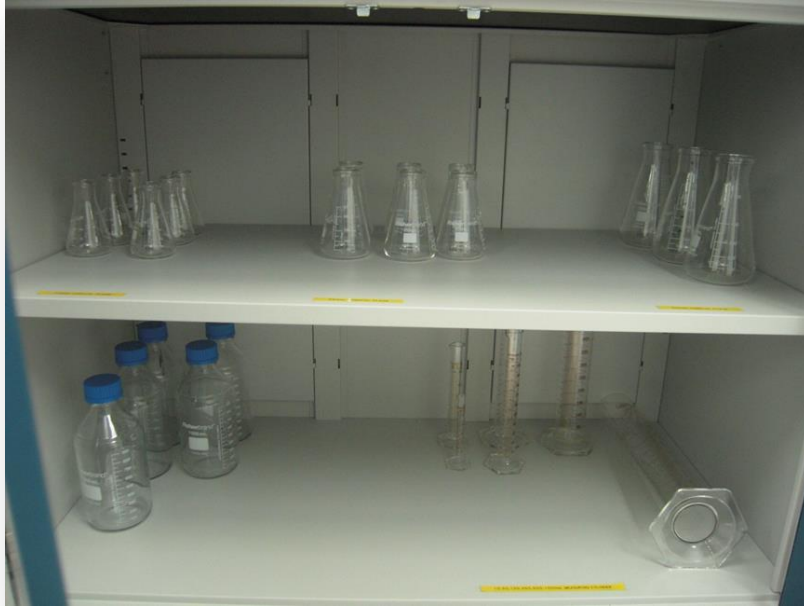
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Worksheet for Proximate Analysis of Coal and Coke

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Worksheet

Sample Log Code: CC		Sample Marking:		
TEST PARAMETER	Inherent Moisture	Ash	Volatile Matter	Fixed Carbon
Test Method:	ASTM D3173 – 11	Test Method: ASTM D3174 – 11	Test Method: ASTM D3175 – 11	Test Method: ASTM D3172 – 07a
Test Description:	1 g sample heat at 107 ° C for 1 hour.	1 g sample ignite at 700 ° C - 750 ° C for 4 hours.	1 g sample closed with cover heating at 950 ° C for exactly 7 minutes.	It is the resultant of the summation of percentage moisture, ash, and volatile matter subtracted from 100.
EC = Empty Crucible SW= Sample Weight Aft = After IM = Inherent Moisture VM= Volatile Matter FC = Fixed Carbon	<u>Analysis 1:</u> EC (g) = SW(g) = A) EC + SW (g) = B) Aft Heat (g) = <u>Analysis 2:</u> EC (g) = SW(g) = A) EC + SW (g) = B) Aft Heat (g) =	<u>Analysis 1:</u> EC (g) = SW(g) = Aft Ignite (g) = <u>Analysis 2:</u> EC (g) = SW(g) = Aft Ignite (g) =	<u>Analysis 1:</u> EC (g) = SW(g) = A) EC + SW (g) = B) Aft Heat (g) = Weight Loss = % <u>Analysis 2:</u> EC (g) = SW(g) = A) EC + SW (g) = B) Aft Heat (g) = Weight Loss = %	
Calculation:	$IM, \% = \frac{A(g) - B(g)}{SW(g)} \times 100$	$Ash, \% = \frac{Aft\ Ignite(g) - EC(g)}{SW(g)} \times 100$	$Weight\ Loss, \% = \frac{A(g) - B(g)}{SW(g)} \times 100$ VM, % = Weight Loss (%) – IM (%)	$FC, \% = 100 - (IM + Ash + VM)$
Result:	Analysis 1 = % Analysis 2 = %	Analysis 1 = % Analysis 2 = %	Analysis 1 = % Analysis 2 = %	
Average Result: (as Air Dry basis)	%	%	%	%
Test Performed by : Date :			Checked by :	



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Certificate of Analysis

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(Your Global Network Inspection & Analytical Laboratory Services) (982959-U)

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Tel: 604 - 611 1293 Fax: 604 - 643 4489 E-MAIL: asmlab@alexstewart.com.my



TEST REPORT

Laboratory Reference Number : ASL/201403/CC - 018, 019, 020, 021 Page No. : 1 of 1
Customer : Alex Stewart (M) Sdn. Bhd.
Customer Reference : ASM/201403/007
Sample Description : Indonesian Steam Coal
Date of Sampling* : 04 - 06 March 2014
Place of Sampling* : Lumut
Name of the Vessel* : STAR MARINE 3001
Quantity* : Lot 1 - 2025 M.T, Lot 2 - 2025 M.T, Lot 3 - 2025 M.T, Lot 4 - 2040 M.T
Date of Sample Received : 10/03/2014 (HGI Sample); 11/03/2014 (Proximate & Ultimate Analysis Sample)
Date of Testing : 10/03/2014 to 12/03/2014
Date of Issue : 12/03/2014

Analysis Result

Parameter Tested	Unit	Analysis Result					Test Method
		Lot 1 2025 M.T	Lot 2 2025 M.T	Lot 3 2025 M.T	Lot 4 2040 M.T	Average 8115 M.T	
Total Moisture (ARB)	%	25.69	24.12	23.79	24.88	24.62	ASTM D3302/D3302M - 12
Inherent Moisture (ADB)	%	7.98	7.86	7.79	7.67	7.82	ASTM D3173 - 11
Ash (ADB)	%	5.23	7.62	5.80	6.31	6.24	ASTM D3174 - 11
Volatile Matter (ADB)	%	42.73	41.30	42.67	42.61	42.33	ASTM D3175 - 11
Fixed Carbon (ADB)	%	44.06	43.22	43.74	43.41	43.61	ASTM D3172 - 07a
Sulphur (ADB)	%	0.56	0.63	0.66	0.76	0.65	ASTM D4239 - 12
Gross Calorific Value (ADB)	kcal/kg	6473	6275	6397	6357	6375	ASTM D5865 - 11a
Net Calorific Value (ARB)	kcal/kg	4879	4830	4943	4827	4870	ASTM D5865 - 11a
Hydrogen (ADB)	%	5.72	5.57	5.73	5.67	5.67	ASTM D5373 - 08
Hardgrove Grindability Index (ADB)	-	59	58	60	57	58	ASTM D409/D409M - 11

Note: The information marked with an * are given by customer. ARB means As Received Basis and ADB means Air Dried Basis.

For Alex Stewart Laboratory (M) Sdn Bhd

Chew Bee Yan, M. Sc., AMIC
Laboratory Manager
IKM No. : A/2378/4983/06

- End of Report -

NOTE: The results shown in this Test Report relate only to the sample(s) tested unless otherwise stated and such sample(s) are retained for 60 days for submitted and shipment samples from the date of issue of Test Report. The total moisture analysed samples will be dispersed after completion of analysis. This Test Report is only valid when signed by an authorised chemist / approved signatory of Alex Stewart Laboratory (M) Sdn Bhd and it shall not be reproduced except in full, without written approval of the Alex Stewart Laboratory (M) Sdn Bhd.



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