Australian Construction Materials

BORAL

MATERIALS TECHNICAL SERVICES
BORAL RESOURCES (NSW) PTY LTD
ABN 51 000 756 507
Unit 4, 3-5 Gibbon Road
Baulkham Hills NSW 2153 Australia
PO Box 400, Winston Hills NSW 2153
Telephone 61 2 9624 9900
Facsimile 61 2 9624 9999

TEST REPORT

CLIENT: XYPEX AUSTRALIA
Address: 9/177 Arthur Street Homebush West NSW 2140

FILE NO: 256/10

SOURCE OF SAMPLE: Unknown

LAB SAMPLE NO: 109680

REQUEST NO.: 40699

SAMPLE IDENTIFICATION: Ecotec Silica Fume – Monthly Sample for November 2010

IDENTIFICATION OF CEMENT USED: BCSC GP Cement – ID # 64514

TEST METHOD: ASTM C-1240-04 Use of Silica Fume as a Mineral Admixture in Hydraulic-Cement Concrete, Mortar & Grout

Accelerated Pozzolanic Strength Activity Index With Portland Cement - ASTM C1240-04

Date Cast: 01-11-10 **Date Crushed:** 08-11-10 @ 7 Days

Results:

Accelerated Pozzolanic Strength Activity Index:	111 %	@ 7 Days
Control Mix Strength:	40.0 MPa	
Test Mix Strength:	44.5 MPa	

Note:
Test mix used 242 mls of water and 6.1 grams of Water Reducer (Rheobuild 1000 from BASF) to obtain a flow of 108%.

Daniel Rowley, Mat. File, File

Muans Abdulnebe

Approved Signatory

Date 17-11-10 *Serial No.* 91840

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NATA Accredited Laboratory Number: **547**

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SOURCE OF SAMPLE: Unknown

SAMPLE IDENTIFICATION: Ecotec Silica Fume –Monthly Sample for November 2010

TEST METHOD: AS3583: Methods of test for supplementary cementitious materials for use with Portland Cement

PROPERTY	DATE TESTED	RESULT	TEST METHOD	AS3582 SPEC.
Moisture content	01-11-10	1.0 %	AS3583.2	Max. 3.0%
Loss on ignition	01-11-10	2.9 %	AS3583.3	Max. 6.0%
Relative Density	01-11-10	2.26	AS3583.5	

- Sample submitted by the client and tested as received

Daniel Rowley, Mat. File, File

Safwan Fawal

Approved Signatory _____

Date 17/11/2010 *Serial No.* 91839

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TEST REPORT

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FILE NO: 256/10

REQUEST NO.: 40699

LAB. SAMPLE NO: 109680

SOURCE OF SAMPLE: Unknown

SAMPLE IDENTIFICATION: Ecotec Silica Fume –Monthly Sample for November 2010

Bulk Density - AS3582.3.6.5

Result: 545 Kg/m^3

Fineness by 45 µm sieve (Retained) – ASTM C430

Result: 32 %

Tatiana Lysova
16-11-2010

Daniel Rowley, Mat. File, File

Sample ID: 109680
Setup ID: None
Converted from:: L:/GEMINI/DATA/L192/3917/109680.MGD
File: L:\...\3917\109680.DMT

Started: 6/12/2010 1:16:48PM
Completed: 6/12/2010 2:39:49PM
Report Time: 6/12/2010 3:49:31PM
Sample Mass: 0.1539 g
Equilibration Interval: 10 s
Sample Density: 1.000 g/cm³

Analysis Adsorptive: N2
Analysis Bath Temp.: 77.150 K
Thermal Correction: No
Warm Free Space: -0.5610 cm³ Measured
Low Pressure Dose: None
Automatic Degas: No

Options Report

Analysis Conditions

Preparation

Fast evacuation: No
Evacuation rate: 5.0 mmHg/s
Unrestricted evacuation from: 5.0 mmHg
Evacuation time: 10.00 h
Leak test: No

Free Space

Free-space type: Measured
Lower dewar for evacuation: Yes
Evacuation time: 0.10 h
Outgas test: No

p° and Temperature

p° and T type: Enter p° below. Enter the Analysis Bath Temperature below.
p°: 781.840 mmHg
Temperature: 77.150 K

Dosing

Use first pressure fixed dose: No
Use maximum volume increment: No
Target tolerance: 5.0% or 5.000 mmHg
Low pressure dosing: No

Equilibration

Equilibration time (p/p° = 1.000000000): 10 s
Minimum equilibration delay at p/p° >= 0.995: 600 s

Sample Backfill

Backfill at start of analysis: Yes
Backfill at end of analysis: Yes
Backfill gas: N2

Adsorptive Properties

Adsorptive: Nitrogen
Maximum manifold pressure: 1050.00 mmHg
Non-ideality factor: 0.0000658
Density conversion factor: 0.0015468
Molecular cross-sectional area: 0.162 nm²

Inside diameter of sample tube: 9.53 mm

Particle & Surface Sciences Pty. Limited

PO Box 1926, Gosford, NSW, Australia 2250. Tel: (61) 02 43 237822 Fax: (61) 02 43 237629 Email: info@pss.aus.net

Sample ID: 109680
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Low Pressure Dose: None
Automatic Degas: No

Langmuir Surface Area Report

Langmuir Surface Area: 31.2828 ± 0.6557 m²/g
Slope: 0.139156 ± 0.002917 g/cm³ STP
Y-Intercept: 3.434743 ± 0.307261 mmHg·g/cm³ STP
b: 0.040514 1/mmHg
Qm: 7.1862 cm³/g STP
Correlation Coefficient: 0.998466
Molecular Cross-Sectional Area: 0.1620 nm²

Pressure (mmHg)	Quantity Adsorbed (cm³/g STP)	p/Q (mmHg·g/cm³ STP)
39.290001	4.6704	8.413
54.080002	4.9776	10.865
68.764999	5.2273	13.155
83.540001	5.4490	15.331
98.260002	5.6312	17.449
112.934998	5.8098	19.439
127.650002	5.9851	21.328
142.425003	6.1681	23.091
157.184998	6.3189	24.876

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Completed: 6/12/2010 2:39:49PM
Report Time: 6/12/2010 3:49:31PM
Sample Mass: 0.1539 g
Equilibration Interval: 10 s
Sample Density: 1.000 g/cm³

Analysis Adsorptive: N2
Analysis Bath Temp.: 77.150 K
Thermal Correction: No
Warm Free Space: -0.5610 cm³ Measured
Low Pressure Dose: None
Automatic Degas: No

BET Surface Area Report

BET Surface Area: 22.8828 ± 0.0392 m²/g
Slope: 0.188377 ± 0.000323 g/cm³ STP
Y-Intercept: 0.001862 ± 0.000044 g/cm³ STP
C: 102.142570
Qm: 5.2565 cm³/g STP
Correlation Coefficient: 0.9999897
Molecular Cross-Sectional Area: 0.1620 nm²

Relative Pressure (p/p°)	Quantity Adsorbed (cm³/g STP)	1/[Q(p°/p - 1)]
0.050253248	4.6704	0.011329
0.069170163	4.9776	0.014929
0.087952774	5.2273	0.018448
0.106850504	5.4490	0.021955
0.125677886	5.6312	0.025526
0.144447705	5.8098	0.029060
0.163268696	5.9851	0.032602
0.182166426	6.1681	0.036112
0.201044961	6.3189	0.039823

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Sample ID: 109680
Setup ID: None
Converted from:: L:/GEMINI/DATA/L192/3917/109680.MGD
File: L:\...\3917\109680.DMT

Started: 6/12/2010 1:16:48PM
Completed: 6/12/2010 2:39:49PM
Report Time: 6/12/2010 3:49:30PM
Sample Mass: 0.1539 g
Equilibration Interval: 10 s
Sample Density: 1.000 g/cm³

Analysis Adsorptive: N2
Analysis Bath Temp.: 77.150 K
Thermal Correction: No
Warm Free Space: -0.5610 cm³ Measured
Low Pressure Dose: None
Automatic Degas: No

Isotherm Tabular Report

Relative Pressure (p/p°)	Absolute Pressure (mmHg)	Quantity Adsorbed (cm³/g STP)	Elapsed Time (h:min)	Saturation Pressure (mmHg)
				781.840027
0.050253248	39.290001	4.6704	00:47	
0.069170163	54.080002	4.9776	00:52	
0.087952774	68.764999	5.2273	00:56	
0.106850504	83.540001	5.4490	01:01	
0.125677886	98.260002	5.6312	01:05	
0.144447705	112.934998	5.8098	01:09	
0.163268696	127.650002	5.9851	01:13	
0.182166426	142.425003	6.1681	01:18	
0.201044961	157.184998	6.3189	01:22	

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Test Report

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9/177 Arthur Street, Homebush west, NSW 2140.

FILE No.:256/10

PROJECT: Testing of Silica Fume Sample.

REQUEST No.: 40699

TEST PROCEDURE: Boral Chemical Method 2 – Determination of metal oxides by Lithium Meta Borate Fusion and analysed using ICP

Laboratory Sample No.:	109680
Date Sampled:	Unknown
Date Received:	28/10/10
Sample Description:	Ecotec Silica Fume - Monthly Nov'10.
Field No.:	1

TEST RESULTS

Silicon as SiO_2 (%)	92.1

Sample submitted by the client.

Nanthini. Selvadurai
Analytical Chemist
3rd December 2010
D.Rowley, File.

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FILE No.:256/10

PROJECT: Testing of Silica Fume Sample.

REQUEST No.: 40699

TEST PROCEDURE:
AS3583.12 – 1991 – Determination of Available Alkali

Laboratory Sample No.:	109680
Date Sampled:	Unknown
Date Received:	28/10/10
Sample Description:	Ecotec Silica Fume - Monthly Nov'10.
Field No.:	1

TEST RESULTS

Sodium as Na_2O (%)	0.27
Potassium as K_2O (%)	0.22
Available Alkali (%)	0.4

Available Alkali (%) = Na_2O (%) + (0.658 x K_2O %)

Samples submitted by the Client.

D.Rowley,File

Nanthini.Selvadurai

Approved Signatory Nalli. S

Date 03-12-10 *Serial No.* 91841

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FILE No.:256/10

PROJECT: Testing of Silica Fume Sample.

REQUEST No.: 40699

TEST PROCEDURE: AS3583.13 – Determination of Chloride Ion Content
AS3583.8 – Determination of Sulfuric Anhydride content

Laboratory Sample No.:	109680
Date Sampled:	Unknown
Date Received:	28/10/10
Sample Description:	Ecotec Silica Fume - Monthly Oct'10
Field No.:	1

TEST RESULTS

Chloride as Cl^- (%)	0.222
Sulphate as SO_3 (%)	0.5

Samples submitted by the Client.

D.Rowley,File.

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Approved Signatory Nanthini. Selvadurai

Date 03-12-10 Serial No. 91842.

NATA Accredited Laboratory Number: 9968