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

FILE No.:256/12

PROJECT: Testing of Silica Fume Sample for December 2012.

REQUEST No.: 50655

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

Laboratory Sample No.:	136253
Date Sampled:	December '12
Date Received:	04/12/12
Sample Description:	Ecotec Silica Fume Sample for December 2012.
Field No.:	1

TEST RESULTS

Silicon as SiO_2 (%)	85.6

Sample submitted by the client.

Nanthini Selvadurai
Analytical Chemist
17th January 2013.
D. Rowley, File

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TEST REPORT

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

FILE NO: 256/12

REQUEST NO: 50655

LAB SAMPLE NO: 136253

SOURCE OF SAMPLE: Unknown

SAMPLE IDENTIFICATION: Ecotec Silica Fume – Monthly Sample for December 2012.

IDENTIFICATION OF CEMENT USED: Boral Cement SL Berrima – ID # 87223

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

Accelerated Pozzolanic Strength Activity Index With Portland Cement - ASTM C1240

Date Cast: 05-12-12

Date Crushed: 12-12-12 @ 7 Days

Results:

Accelerated Pozzolanic Strength Activity Index:	99% @ 7 Days
Control Mix Strength:	35.8 MPa
Test Mix Strength:	35.5 MPa

Note:
Test mix used 242 mls of water and 6.0 grams of Water Reducer (Rheobuild 1000 from BASF) to obtain a flow of 104%.

Daniel Rowley, Mat. File, File

Muans Abdulnebe

Approved Signatory

Date 20-12-12 *Serial No.* 112201

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TEST REPORT

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

FILE NO: 256/12

REQUEST NO: 50655

LAB. SAMPLE NO: 136253

SOURCE OF SAMPLE: Unknown

SAMPLE IDENTIFICATION: Ecotec Silica Fume – Monthly Sample for December 2012.

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	05-12-12	1.2%	AS3583.2	Max. 3.0%
Loss on ignition	05-12-12	2.7%	AS3583.3	Max. 6.0%
Relative Density	05-12-12	2.27	AS3583.5	

Sample submitted by the client.

Daniel Rowley, Mat. File, File

Safwan Fawal

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Approved Signatory _____

Date 22/01/2013 *Serial No.* 112202

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Test Report

CLIENT: XYPEX AUSTRALIA
9/177 Arthur Street, Homebush west, NSW 2140.

FILE No.:256/12

PROJECT: Testing of Silica Fume Sample.

REQUEST No.: 50655

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

Laboratory Sample No.:	136253
Date Sampled:	Unknown
Date Received:	04/12/12
Sample Description:	Ecotec Silica Fume sample for December 2012.
Field No.:	1

TEST RESULTS

Sodium as Na_2O (%)	0.41
Potassium as K_2O (%)	0.19
Available Alkali (%)	0.5

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

Samples submitted by the Client.

D. Rowley, File

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Approved Signatory NDS Nanthini Selvadurai

Date 23-01-13 Serial No. 112203

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Test Report

CLIENT: XYPEX AUSTRALIA
9/177 Arthur Street, Homebush west, NSW 2140.

FILE No.:256/12

PROJECT: Testing of Silica Fume Sample for December 2012.

REQUEST No.: 50655

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

Laboratory Sample No.:	136253
Date Sampled:	December'12
Date Received:	04/12/12
Sample Description:	Ecotec Silica Fume Sample for December 2012
Field No.:	1

TEST RESULTS

Chloride as Cl^- (%)	0.097
Sulphate as SO_3 (%)	0.6

Samples submitted by the Client.

D. Rowley , File

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Approved Signatory N.S Nanthini Selvadurai
Date 23-01-13 Serial No. 112204

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Boral Construction Materials

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TEST REPORT

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

FILE NO: 256/12

REQUEST NO: 50655

LAB. SAMPLE NO: 136253

SOURCE OF SAMPLE: Unknown

SAMPLE IDENTIFICATION: Ecotec Silica Fume – Monthly Sample for December 2012

Bulk Density - AS3582.3.6.5

Result: 626 Kg/m^3

Daniel Rowley, Mat. File, File

Oscar Perez
17-01-2013

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: Silica Fume Ecotec-Monthly-Dec2012-LSN:136253
Setup ID:
Converted from:: L:/GEMINI/DATA/L192/4463/LSN.MGD
File: L:\...\4463\LSN.DMT

Started:	22/01/2013 1:51:30PM	Analysis Adsorptive:	N2
Completed:	22/01/2013 2:29:33PM	Analysis Bath Temp.:	77.150 K
Report Time:	24/01/2013 12:57:34PM	Thermal Correction:	No
Sample Mass:	0.6993 g	Warm Free Space:	Quasi-Gemini
Cold Free Space:	Quasi-Gemini	Equilibration Interval:	5 s
Low Pressure Dose:	None	Sample Density:	1.000 g/cm³
Automatic Degas:	No		

Summary Report

Surface Area

Single point surface area at p/p° = 0.200544532: 21.1446 m²/g

BET Surface Area: 21.7041 m²/g

Langmuir Surface Area: 29.3320 m²/g

Particle & Surface Sciences Pty. Limited

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Analysis Bath Temp.: 77.150 K
Thermal Correction: No
Warm Free Space: Quasi-Gemini
Equilibration Interval: 5 s
Sample Density: 1.000 g/cm³

BET Surface Area Report

BET Surface Area: 21.7041 ± 0.1244 m²/g
Slope: 0.199584 ± 0.001140 g/cm³ STP
Y-Intercept: 0.000987 ± 0.000153 g/cm³ STP
C: 203.215299
Qm: 4.9858 cm³/g STP
Correlation Coefficient: 0.9998859
Molecular Cross-Sectional Area: 0.1620 nm²

Relative Pressure (p/p°)	Quantity Adsorbed (cm³/g STP)	1/[Q(p°/p - 1)]
0.050254716	4.7308	0.011185
0.069131103	4.9935	0.014872
0.087819045	5.2035	0.018502
0.106623954	5.3852	0.022163
0.125383383	5.5464	0.025847
0.144220774	5.6935	0.029600
0.162947712	5.8288	0.033398
0.181778608	5.9562	0.037300
0.200544532	6.0757	0.041288

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Report Time: 24/01/2013 12:57:34PM
Sample Mass: 0.6993 g
Cold Free Space: Quasi-Gemini
Low Pressure Dose: None
Automatic Degas: No

Analysis Adsorptive: N2
Analysis Bath Temp.: 77.150 K
Thermal Correction: No
Warm Free Space: Quasi-Gemini
Equilibration Interval: 5 s
Sample Density: 1.000 g/cm³

Langmuir Surface Area Report

Langmuir Surface Area: 29.3320 ± 0.4499 m²/g
Slope: 0.148411 ± 0.002276 g/cm³ STP
Y-Intercept: 2.825815 ± 0.235534 mmHg·g/cm³ STP
b: 0.052520 1/mmHg
Qm: 6.7380 cm³/g STP
Correlation Coefficient: 0.999178
Molecular Cross-Sectional Area: 0.1620 nm²

Pressure (mmHg)	Quantity Adsorbed (cm³/g STP)	p/Q (mmHg·g/cm³ STP)
38.669998	4.7308	8.174
53.195000	4.9935	10.653
67.574997	5.2035	12.986
82.044998	5.3852	15.235
96.480003	5.5464	17.395
110.974998	5.6935	19.492
125.385002	5.8288	21.511
139.875000	5.9562	23.484
154.315002	6.0757	25.399