



**Boral Construction Materials
Materials Technical Services**

Unit 4, 3-5 Gibbon Road
Baulkham Hills NSW 2153 Australia
PO Box 400, Winston Hills NSW 2153

T: +61 (02) 9624 9900
F: +61 (02) 9624 9999

www.boral.com.au

TEST REPORT

CLIENT: XYPEX AUSTRALIA
Address: 190 Toongabbie Road Girraween, NSW 2145

FILE NO: 256/18

LAB SAMPLE NO: 212126

REQUEST No: 81057

SAMPLE IDENTIFICATION: Ecotec Silica Fume – Monthly Sample for Start of October 2018

IDENTIFICATION OF CEMENT USED: Boral Cement SL Berrima Ref. No. 203-608-001-Aug 2016

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

PROPERTY	DATE TESTED	RESULT	TEST METHOD
Relative density	14/11/2018	2.21	AS 3583.5
Relative water requirement	15/11/2018	111%	AS 3583.6
Relative strength 7days (accelerated)	22/11/2018	115%	AS 3583.6
Relative strength 28days (standard)	13/12/2018	102%	AS 3583.6

Shaun Guthridge, Mat. File, File



Approved Signatory Julius C. Alvaro
Date 14/12/18 Serial No. 17 5 5 4 9

Accredited for compliance with ISO/IEC 17025

NATA Accredited Laboratory

Number: 547



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IDENTIFICATION OF CEMENT USED: Boral Cement SL Berrima -- Ref. 2016

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: 06/12/2018

Date Crushed: 13/12/2018 @ 7 Days

Results:	Accelerated Pozzolanic Strength Activity Index:	128% @ 7 Days
	Control Mix Strength:	28.4 MPa
	Test Mix Strength:	36.3 MPa

Note:

Test mix used 242 mls of water and 1.6 grams of Dry Water Reducer (1000 NT from BASF) to obtain a flow of 100 %.

Shaun Guthridge, Mat. File, File



Approved Signatory

Julius C. Alvaro

Julius Alvaro

Date 14/12/18

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FILE NO: 256/18

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SOURCE OF SAMPLE: Unknown

SAMPLE IDENTIFICATION: Ecotec Silica Fume – Monthly Sample for Start of October 2018

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	12/12/2018	0.9%	AS 3583.2	Max. 3.0%
Loss on ignition	12/12/2018	1.9%	AS 3583.3	Max. 6.0%
Relative Density	14/11/2018	2.21	AS 3583.5	

Sample submitted by the client.

Shaun Guthridge, Mat. File, File



Approved Signatory Julius C. Alvaro Julius Alvaro
Date 14/12/18 Serial No. 17 5 5 5 1

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TEST REPORT

CLIENT: XYPEX AUSTRALIA

FILE NO: 256/18

ADDRESS: 190 Toongabbie Road, Girraween, NSW 2145

REQUEST NO: 81057

LAB. SAMPLE NO: 212126

SOURCE OF SAMPLE: Unknown

SAMPLE IDENTIFICATION: Ecotec Silica Fume – Monthly Sample for Start of October 2018

Bulk Density - AS3582.3 – Clause 7.1.7

Result: 641 Kg/m³

Shaun Guthridge, Mat. File, File

A handwritten signature in black ink that reads "Julius C. Alvaro".
Julius Alvaro
13/12/2018



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TEST REPORT

CLIENT: XYPEX AUSTRALIA
190 Toongabbie Road, Girraween , NSW 2145.

FILE No.:256/18

PROJECT: Testing of Silica Fume sample for October .2018.

REQUEST No.: 81057

TEST PROCEDURE:

AS 3583.12 – 1991 – Determination of Available Alkali

Laboratory Sample No.:	212126
Date Sampled:	October'2018
Date Received:	26/10/18
Sample Description:	Ecotec Silca Fume – Monthly Sample for October' 2018.
Field No.:	1

TEST RESULTS:

Sodium as Na ₂ O (%)	0.11
Potassium as K ₂ O (%)	0.07
Available Alkali (%)	0.2

Available Alkali (%) = Na₂O (%) + (0.658 x K₂O %)

Samples submitted by the Client.

S.Guthridge, Mat. File, File.



Approved Signatory N.S. Nanthini Selvadurai
 Date 06-12-18 Serial No. 175552

Accredited for compliance with ISO/IEC 17025

NATA Accredited Laboratory

Number: 9968



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TEST REPORT

CLIENT: XYPEX AUSTRALIA
190 Toongabbie Road, Girraween NSW 2145.

FILE No.:256/18

PROJECT: Testing of Silica Fume sample for October' 2018

REQUEST No.:81057

TEST PROCEDURE: AS 3583.13 – Determination of Chloride Ion content
AS 3583.8 – Determination of Sulfuric Anhydride content

Laboratory Sample No.: 212126
Date Sampled: October'2018
Date Received: 26/10/18
Sample Description: Ecotec Silca Fume
monthly sample for
October' 2018.
Field No.: 1

TEST RESULTS:

Chloride as Cl⁻ (%) 0.002
Sulphate as SO₃ (%) 0.8

Samples submitted by the Client.

S.Guthridge, Mat. File, File.



Approved Signatory

Nanthini Selvadurai

Date

Serial No.

17 5 5 3

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TEST REPORT

CLIENT: XYPEX AUSTRALIA
190, Toongabbie Road Girraween NSW 2145.

FILE No.: 256/18

PROJECT: Testing of Silica fume sample for October' 2018.

REQUEST No.: 81057

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

Laboratory Sample No.: 212126
Date Sampled: October' 2018.
Date Received: 26/10/18
Sample Description: Ecotec Silica Fume
October' 2018.
Field No.: 1

TEST RESULTS

Silicon as SiO₂ (%) 95.2

Sample submitted by the Client.

Nanthini S
Analytical Chemist
05th December 2018.
S.Guthridge, Mat. File, File.

Sample: Ecotec Silica Fume-Monthly-October2018-LSN 212126
Operator: KW
Submitter: Boral
File: \\pssccloud\public\PsS\Customers\L192 - ...1000-096.SMP

Started:	3/12/2018 12:34:57 AM	Analysis adsorptive:	N2
Completed:	3/12/2018 3:15:04 AM	Analysis bath temp.:	77.472 K
Report time:	4/12/2018 10:23:19 AM	Thermal correction:	No
Sample mass:	0.9005 g	Warm free space:	12.2752 cm ³ Measured
Cold free space:	32.3589 cm ³	Equilibration interval:	15 s
Low pressure dose:	None	Sample density:	1.000 g/cm ³
Automatic degas:	No		

Summary Report

Surface Area

Single point surface area at $p/p^\circ = 0.149630636$: 17.2109 m²/g
BET Surface Area: 17.5196 m²/g
Langmuir Surface Area: 24.6100 m²/g

Sample: Ecotec Silica Fume-Monthly-October2018-LSN 212126
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 Submitter: Boral
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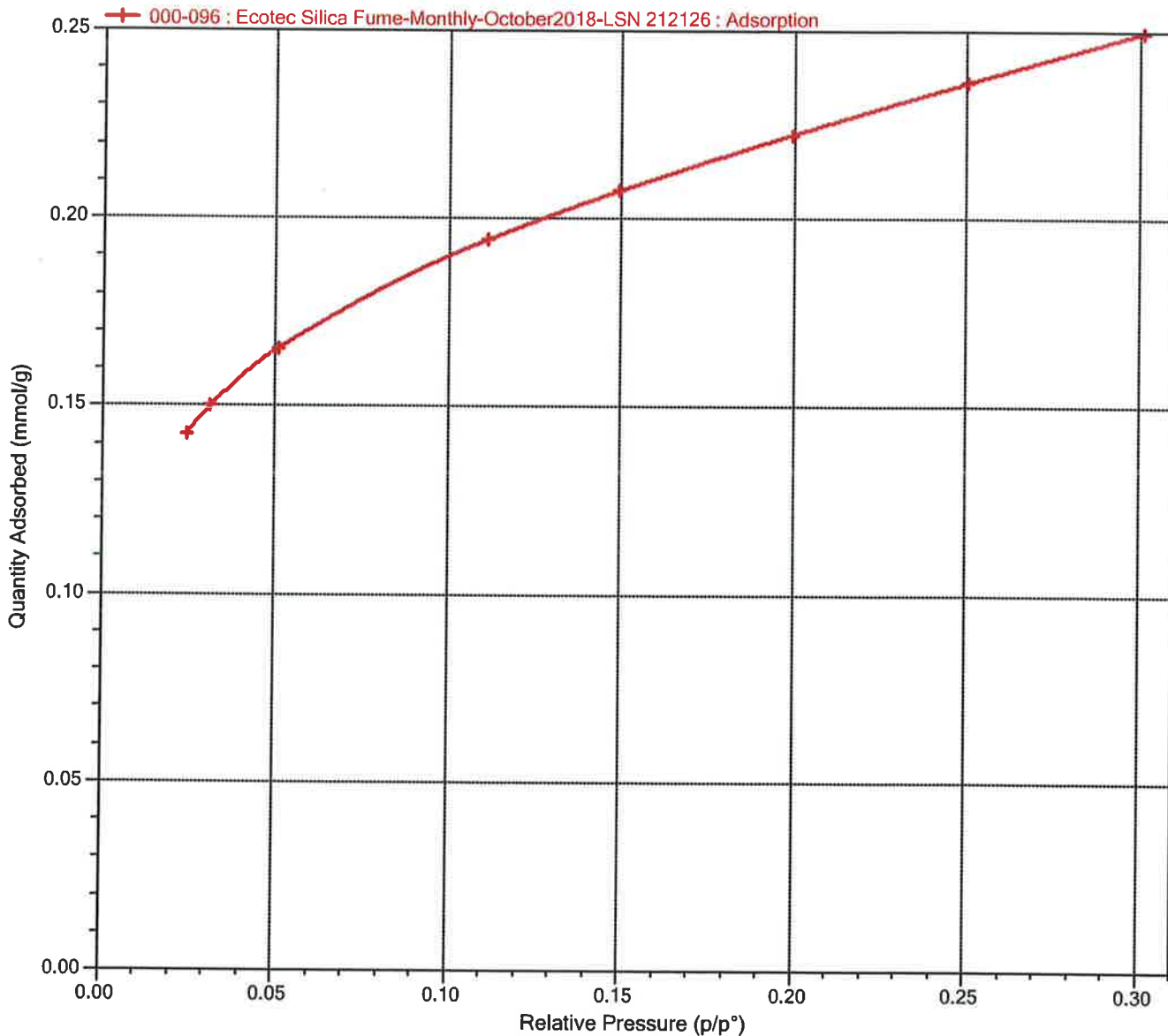
Isotherm Tabular Report

Relative Pressure (p/p ^o)	Absolute Pressure (kPa)	Quantity Adsorbed (mmol/g)	Elapsed Time (h:min)	Saturation Pressure (kPa)
			01:53	102.7651484
0.024808126	2.5494107	0.14285	02:03	
0.031467236	3.2337352	0.14996	02:06	
0.050932977	5.2341350	0.16540	02:11	
0.111561083	11.4645912	0.19439	02:16	
0.149528079	15.3662753	0.20743	02:20	
0.199848826	20.5374943	0.22244	02:23	
0.250479875	25.7406015	0.23631	02:27	
0.301303816	30.9635313	0.24972	02:30	

Sample: Ecotec Silica Fume-Monthly-October2018-LSN 212126
Operator: KW
Submitter: Boral
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Low pressure dose:	None	Sample density:	1.000 g/cm ³
Automatic degas:	No		

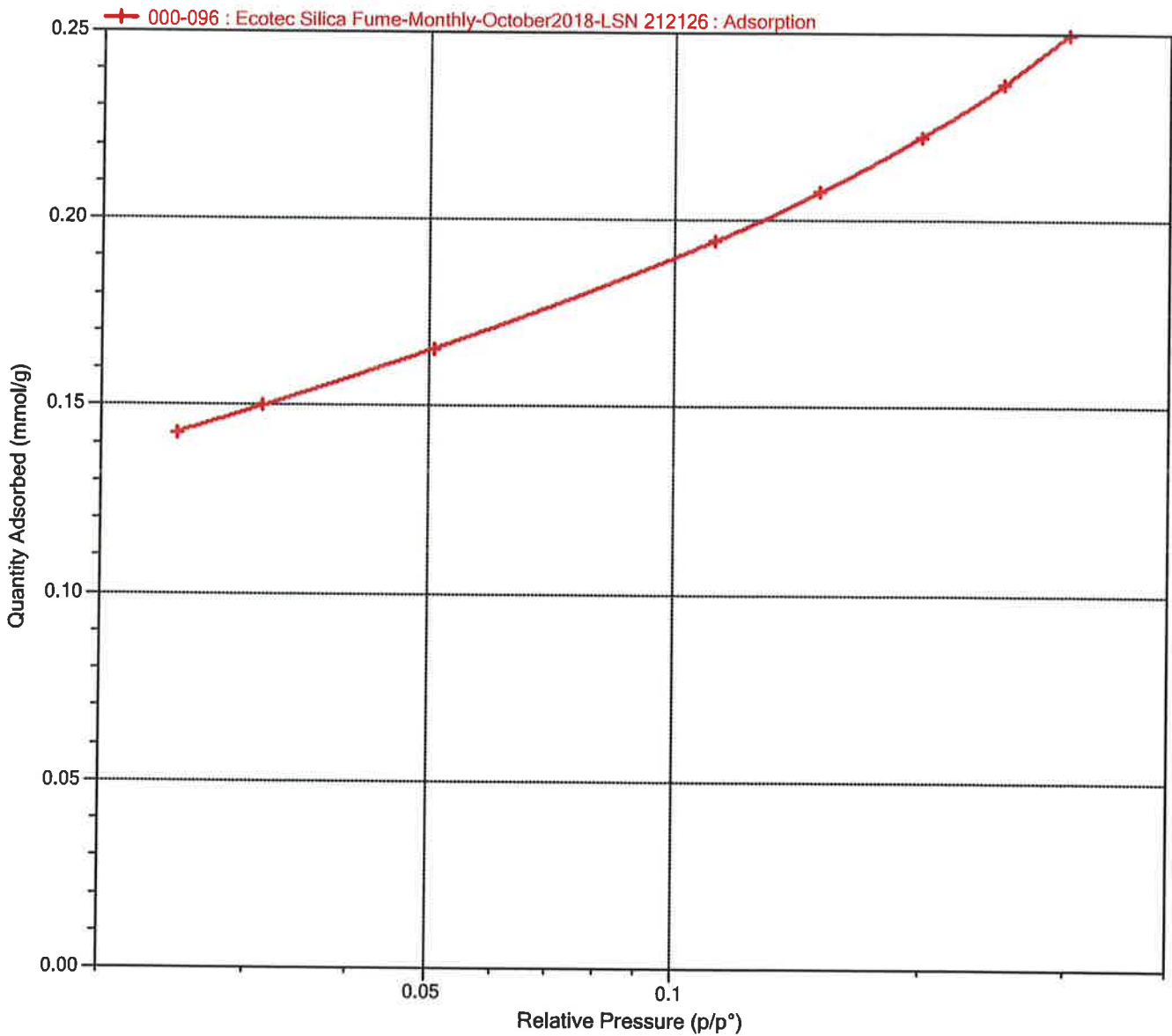
Isotherm Linear Plot



Sample: Ecotec Silica Fume-Monthly-October2018-LSN 212126
Operator: KW
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Cold free space:	32.3589 cm ³	Equilibration interval:	15 s
Low pressure dose:	None	Sample density:	1.000 g/cm ³
Automatic degas:	No		

Isotherm Log Plot



Sample: Ecotec Silica Fume-Monthly-October2018-LSN 212126
 Operator: KW
 Submitter: Boral
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Completed:	3/12/2018 3:15:04 AM	Analysis bath temp.:	77.472 K
Report time:	4/12/2018 10:23:19 AM	Thermal correction:	No
Sample mass:	0.9005 g	Warm free space:	12.2752 cm ³ Measured
Cold free space:	32.3589 cm ³	Equilibration interval:	15 s
Low pressure dose:	None	Sample density:	1.000 g/cm ³
Automatic degas:	No		

BET Report

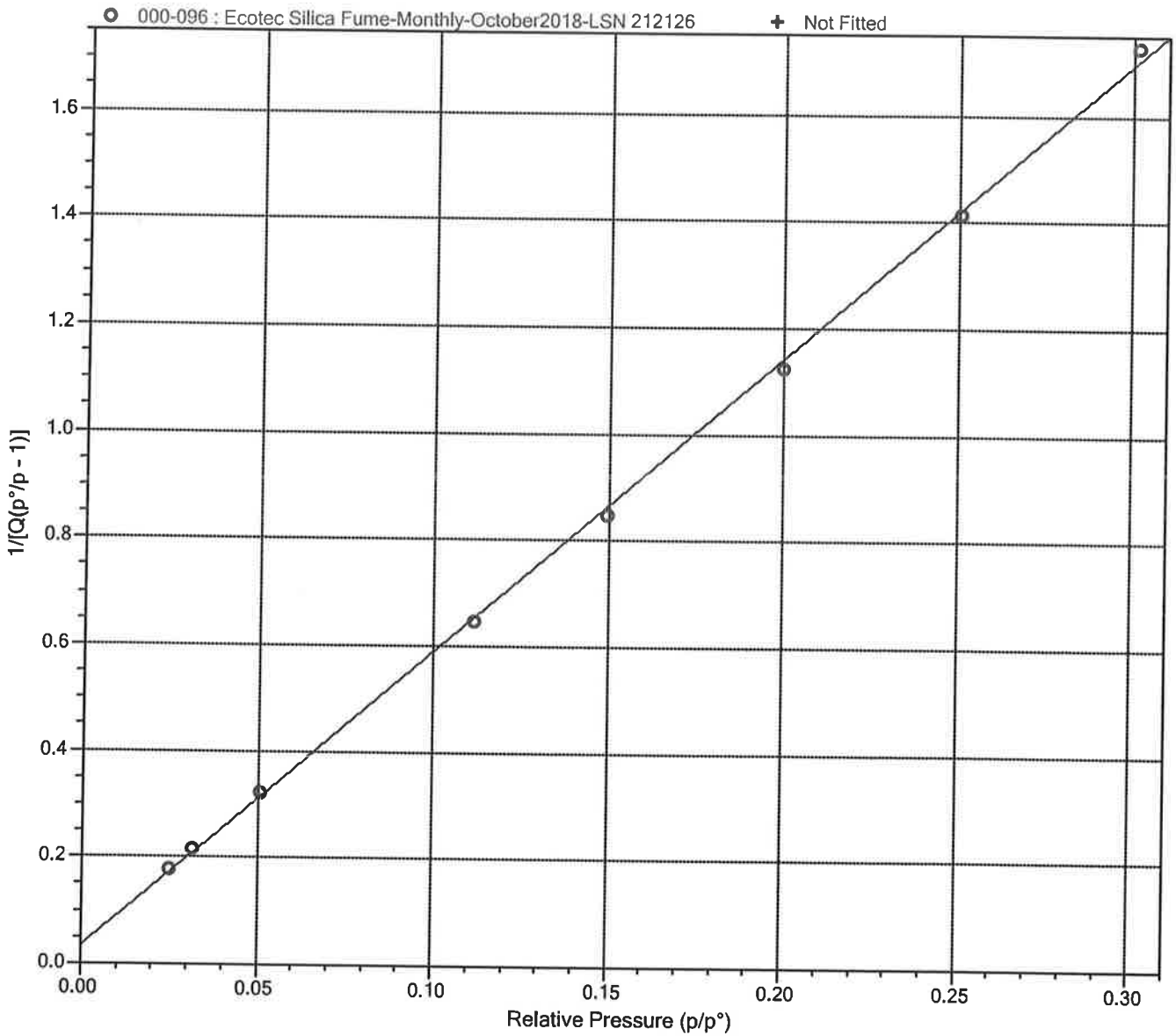
BET surface area: 17.5196 ± 0.1765 m²/g
 Slope: 5.533652 ± 0.055299 g/mmol
 Y-intercept: 0.034920 ± 0.009427 g/mmol
 C: 159.465287
 Qm: 0.17958 mmol/g
 Correlation coefficient: 0.9997005
 Molecular cross-sectional area: 0.1620 nm²

Relative Pressure (p/p ^o)	Quantity Adsorbed (mmol/g)	1/[Q(p ^o /p - 1)]
0.024808126	0.14285	0.17809
0.031467236	0.14996	0.21665
0.050932977	0.16540	0.32446
0.111561083	0.19439	0.64597
0.149528079	0.20743	0.84759
0.199848826	0.22244	1.12282
0.250479875	0.23631	1.41416
0.301303816	0.24972	1.72691

Sample: Ecotec Silica Fume-Monthly-October2018-LSN 212126
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Sample mass: 0.9005 g	Warm free space: 12.2752 cm ³ Measured
Cold free space: 32.3589 cm ³	Equilibration interval: 15 s
Low pressure dose: None	Sample density: 1.000 g/cm ³
Automatic degas: No	

BET Surface Area Plot



Sample: Ecotec Silica Fume-Monthly-October2018-LSN 212126
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Low pressure dose:	None	Sample density:	1.000 g/cm ³
Automatic degas:	No		

Langmuir Report

Langmuir surface area: 24.6100 ± 0.7970 m²/g
 Slope: 3.96420 ± 0.12838 g/mmol
 Y-intercept: 10.267 ± 1.877 g/mmol·kPa
^b: 0.38610 1/kPa
 Qm: 0.25226 mmol/g
 Correlation coefficient: 0.997388
 Molecular cross-sectional area: 0.1620 nm²

Pressure (kPa)	Quantity Adsorbed (mmol/g)	p/Q (g/mmol·kPa)
2.5494107	0.14285	17.847
3.2337352	0.14996	21.564
5.2341350	0.16540	31.645
11.4645912	0.19439	58.978
15.3662753	0.20743	74.079
20.5374943	0.22244	92.327
25.7406015	0.23631	108.925

Sample: Ecotec Silica Fume-Monthly-October2018-LSN 212126
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Low pressure dose: None	Sample density: 1.000 g/cm ³
Automatic degas: No	

Langmuir Surface Area Plot

