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: 256/19

LAB SAMPLE NO: 223498

DATE RECEIVED: 20/08/2019

REQUEST No: 85541

SAMPLE IDENTIFICATION: Ecotec Silica Fume – Monthly Sample for Mid of August 2019

IDENTIFICATION OF CEMENT USED: Boral Cement SL Berrima Ref. No. 211-903-368-Mar 2019

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

PROPERTY	DATE TESTED	RESULT	TEST METHOD
Relative density	10/09/2019	2.23	AS 3583.5
Relative water requirement	10/09/2019	111%	AS 3583.6
Relative strength 7days (accelerated)	17/09/2019	100%	AS 3583.6
Relative strength 28days (standard)	08/10/2019	100%	AS 3583.6

Notes:

- Sample supplied by the client and tested as received.
- Test results in this Test Report relate only to samples tested.

Shaun Guthridge, Mat. File, File

Approved Signatory Julius Alvaro
Date 10/10/19 Serial No. CEM85541.JA.1

NATA ACCREDITED FOR TECHNICAL COMPETENCE

NATA Accredited Laboratory
Number: 547

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TEST REPORT

CLIENT: XYPEX AUSTRALIA

FILE NO: 256/19

ADDRESS: 190 Toongabbie Road, Girraween, NSW 2145

REQUEST NO: 85541

LAB SAMPLE NO: 223498

SOURCE OF SAMPLE: Unknown

DATE RECEIVED: 20/08/2019

SAMPLE IDENTIFICATION: Ecotec Silica Fume – Monthly Sample for Mid of August 2019

IDENTIFICATION OF CEMENT USED: Boral Cement SL Berrima – Ref. 2019

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: 17/09/2019

Date Crushed: 24/09/2019 @ 7 Days

Results:

Accelerated Pozzolanic Strength Activity Index:	**108%** @ 7 Days
Control Mix Strength:	**31.2 MPa**
Test Mix Strength:	**33.8 MPa**

Note:
Test mix used 242 mls of water and **2.2** grams of Dry Water Reducer (1000 NT from BASF) to obtain a flow of **100%**.

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Shaun Guthridge, Mat. File, File

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

Approved Signatory: Julius Alvaro

Date _____ Serial No. CEM85541.JA.2

NATA Accredited Laboratory

Number: 547

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TEST REPORT

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

FILE NO: 256/19

REQUEST NO: 85541

LAB. SAMPLE NO: 223498

SOURCE OF SAMPLE: Unknown

DATE RECEIVED: 20/08/2019

SAMPLE IDENTIFICATION: Ecotec Silica Fume – Monthly Sample for Mid of August 2019

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	10/10/2019	0.6%	AS 3583.2	Max. 3.0%
Loss on ignition	10/10/2019	1.5%	AS 3583.3	Max. 6.0%
Relative Density	10/09/2019	2.23	AS 3583.5	

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Shaun Guthridge, Mat. File, File

Approved Signatory Julius Alvaro

Date 10/10/19 Serial No. CEM85541.JA.3

NATA ACCREDITED FOR TECHNICAL COMPETENCE

NATA Accredited Laboratory

Number: 547

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TEST REPORT

CLIENT: XYPEX AUSTRALIA

FILE NO: 256/19

ADDRESS: 190 Toongabbie Road, Girraween, NSW 2145

REQUEST NO: 85541

LAB. SAMPLE NO: 223498

SOURCE OF SAMPLE: Unknown

DATE RECEIVED: 20/08/2019

SAMPLE IDENTIFICATION: Ecotec Silica Fume – Monthly Sample for Mid of August 2019

PROPERTY	DATE TESTED	RESULT	TEST METHOD
Bulk Density	10/10/2019	652 Kg/m^3	AS3582.3 – Clause 7.1.7

Notes:

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Shaun Guthridge, Mat. File, File

Julius Alvaro
10/10/2019

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TEST REPORT

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

FILE No.:256/19

PROJECT: Testing of Silica Fume sample for Mid of August '2019.

REQUEST No.: 85541

TEST PROCEDURE:
AS 3583.12 – 1991 – Determination of Available Alkali

Laboratory Sample No.:	223498
Date Sampled:	Mid of August '2019
Date Received:	20/08/19
Date Tested:	25/09/19
Sample Description:	Ecotec Silca Fume – Monthly Sample Mid of August '2019.
Field No.:	1

TEST RESULTS:

Sodium as Na_2O (%)	0.06
Potassium as K_2O (%)	0.05
Available Alkali (%)	0.1

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

Note:

- Samples submitted by the Client.
- Test results in this Test Report relate only to the sample tested

S.Guthridge, Mat. File, File.

Approved Signatory NDS Nanthini Selvadurai

Date 26-09-19 Serial No. CHEM85541.NS.1

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TEST REPORT

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

FILE No.:256/19

PROJECT: Testing of Silica Fume sample for Mid of August '2019

REQUEST No.:85541

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

Laboratory Sample No.:	223498
Date Sampled:	Mid of August '2019
Date Received:	20/08/19
Date Tested:	10/09/19 to 24/09/19
Sample Description:	Ecotec Silca Fume monthly sample Mid of August' 2019.
Field No.:	1

TEST RESULTS:

Chloride as Cl^- (%)	0.069
Sulphate as SO_3 (%)	< 0.1

Note:

- Samples submitted by the Client.
- Test results in this Test Report relate only to the sample tested

S.Guthridge, Mat. File, File.

Approved Signatory NQS Nanthini Selvadurai

Date 26-09-19. Serial No. CHEM85541.NS.2

NATA ACCREDITED FOR TECHNICAL COMPETENCE

NATA Accredited Laboratory

Number: 9968

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TEST REPORT

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

FILE No.: 256/19

PROJECT: Testing of Silica fume sample for Mid August' 2019.

REQUEST No.: 85541

TEST PROCEDURE: AS 2350.2 - Chemical Composition using XRF - Bruker S8 Tiger

Laboratory Sample No.:	223498
Date Sampled:	Mid of August' 2019.
Date Received:	20/08/19
Sample Description:	Ecotec Silica Fume monthly sample Mid of August' 2019.
Field No.:	1

TEST RESULTS

Silicon as SiO_2 (%)	95.6
Sodium as Na_2O (%)	0.21
Potassium as K_2O (%)	0.71
Total Alkali content as Na_2O equiv. (%)	0.7

Sample submitted by the Client.

Nanthini S
Analytical Chemist
24th September 2019.
S.Guthridge, Mat. File, File.

Particle and Surface Sciences Pty. Limited

PO Box 1926, Gosford NSW Australia 2250 Phone: (+61) 02 4323 7822 Email: pssinfo@bigpond.com ACN: 051 682 396 ABN: 32 051 682 396

Sample: Silica Fume- Ecotec-Monthly-Mid Aug 2019-LSN-223498
Operator: KW
Submitter: Boral
File: C:\Users\kayla\Dropbox (PsS)\Lab\Custom...\000-149.SMP

Started:	29/09/2019 5:27:09 AM	Analysis adsorptive:	N2
Completed:	29/09/2019 8:47:16 AM	Analysis bath temp.:	77.350 K
Report time:	1/10/2019 4:07:56 PM	Thermal correction:	No
Sample mass:	0.3403 g	Warm free space:	18.5365 cm³ Measured
Cold free space:	54.8890 cm³	Equilibration Interval:	15 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° = 0.149630636: 19.1950 m²/g

BET Surface Area: 18.9490 m²/g

Langmuir Surface Area: 28.6715 m²/g

Sample: Silica Fume- Ecotec-Monthly-Mid Aug 2019-LSN-223498
Operator: KW
Submitter: Boral
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Low pressure dose: None
Automatic degas: No

Analysis adsorptive: N2
Analysis bath temp.: 77.350 K
Thermal correction: No
Warm free space: 18.5365 cm³ Measured
Equilibration interval: 15 s
Sample density: 1.000 g/cm³

Isotherm Tabular Report

Relative Pressure (p/p°)	Absolute Pressure (mmHg)	Quantity Adsorbed (cm³/g STP)	Elapsed Time (h:min)	Saturation Pressure (mmHg)
			02:39	775.156128
0.055313898	42.876907	4.2645	02:55	
0.085556091	66.319328	4.6287	02:59	
0.121148847	93.909271	4.9529	03:02	
0.157782387	122.305984	5.2362	03:06	
0.193708732	150.154510	5.4773	03:09	
0.228861188	177.403152	5.6927	03:13	
0.265321266	205.665405	5.9013	03:16	
0.300893993	233.239822	6.1105	03:20	

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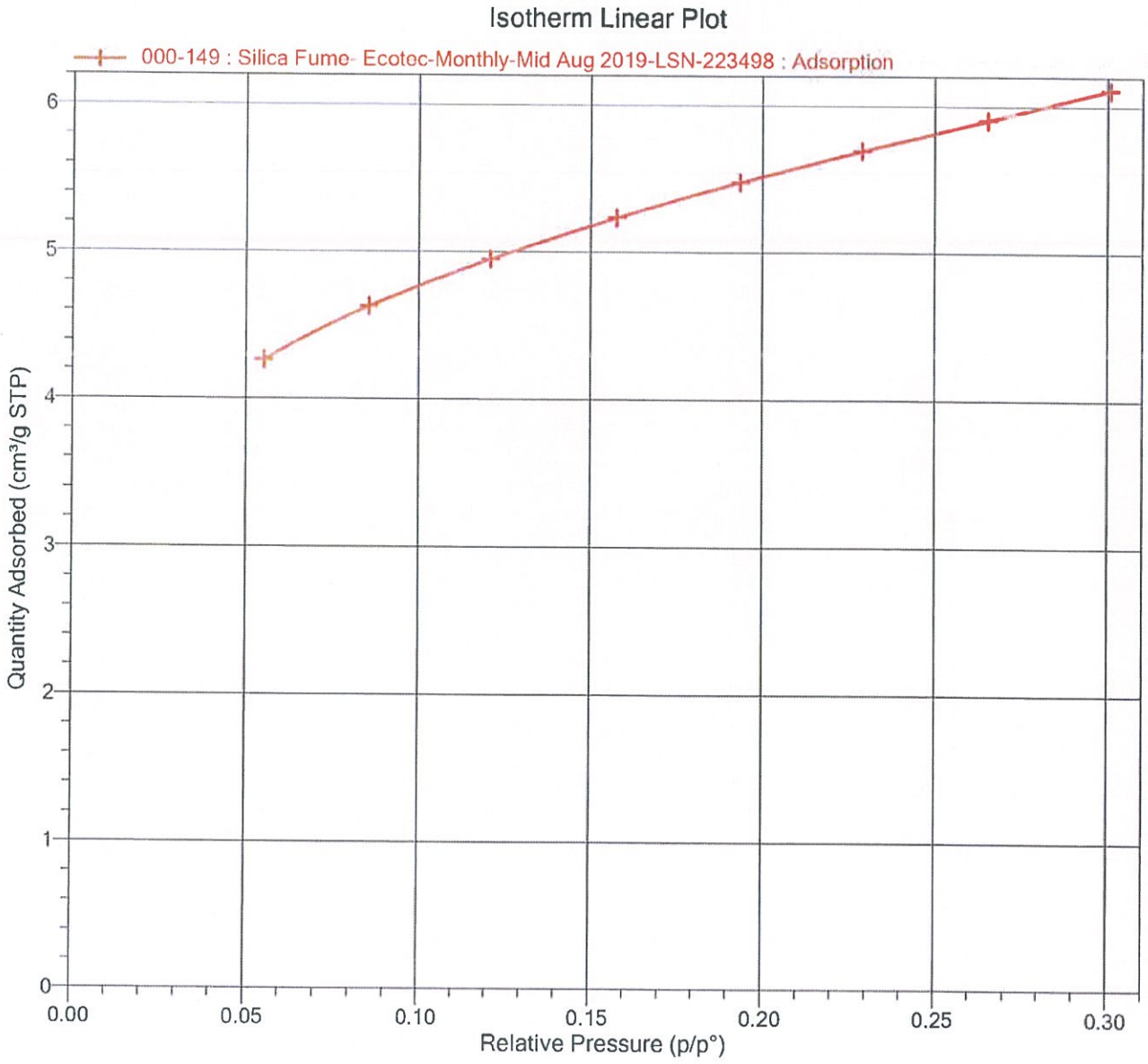
Automatic degas:	No		



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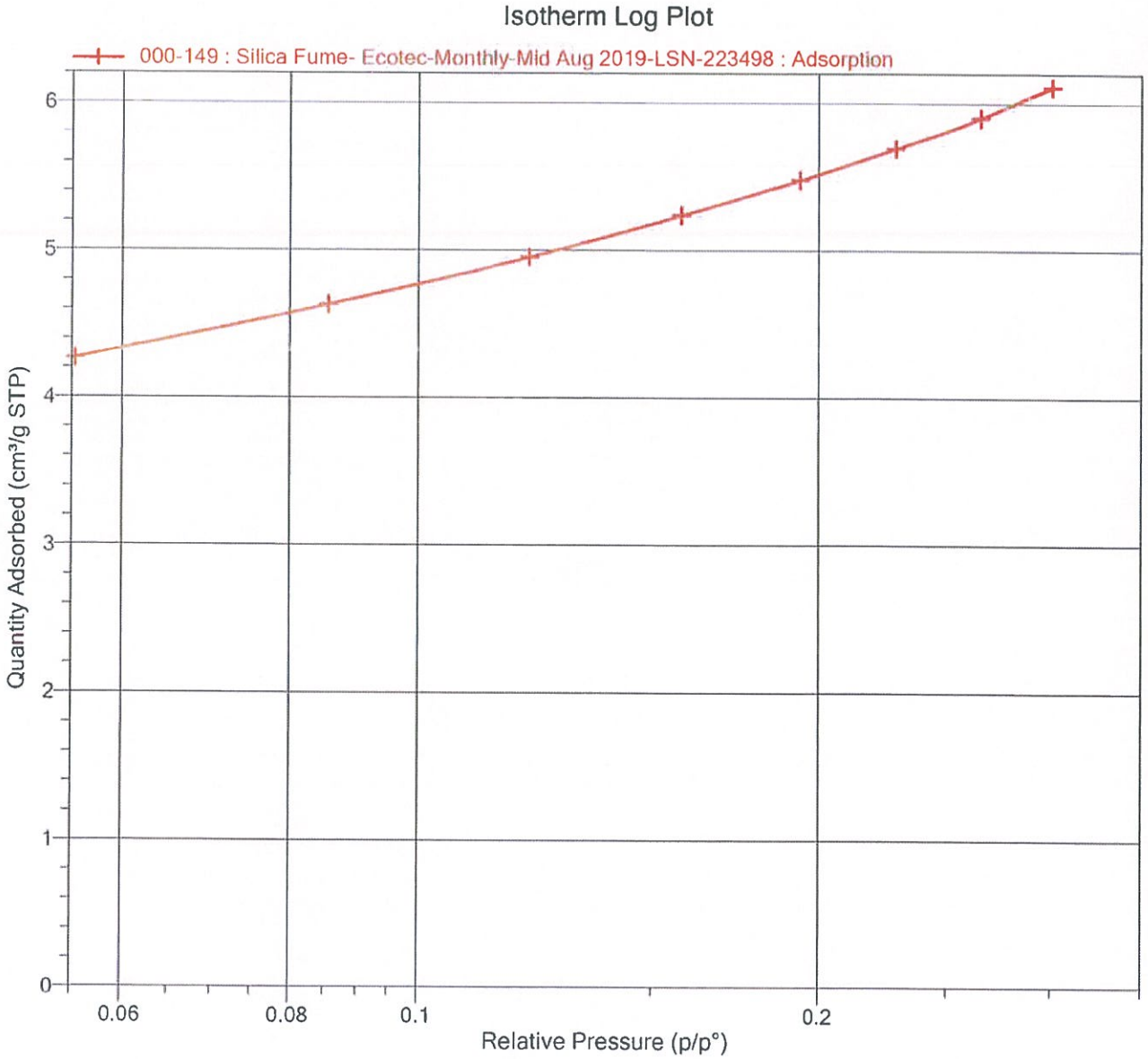
Automatic degas:	No		



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Analysis bath temp.: 77.350 K
Thermal correction: No
Warm free space: 18.5365 cm³ Measured
Equilibration interval: 15 s
Sample density: 1.000 g/cm³

BET Report

BET surface area: 18.9490 ± 0.2850 m²/g
Slope: 0.229452 ± 0.003392 g/cm³ STP
Y-intercept: 0.000247 ± 0.000658 g/cm³ STP
C: 928.522177
Qm: 4.3535 cm³/g STP
Correlation coefficient: 0.9993450
Molecular cross-sectional area: 0.1620 nm²

Relative Pressure (p/p°)	Quantity Adsorbed (cm³/g STP)	1/[Q(p°/p - 1)]
0.055313898	4.2645	0.013730
0.085556091	4.6287	0.020213
0.121148847	4.9529	0.027832
0.157782387	5.2362	0.035778
0.193708732	5.4773	0.043862
0.228861188	5.6927	0.052134
0.265321266	5.9013	0.061196
0.300893993	6.1105	0.070436

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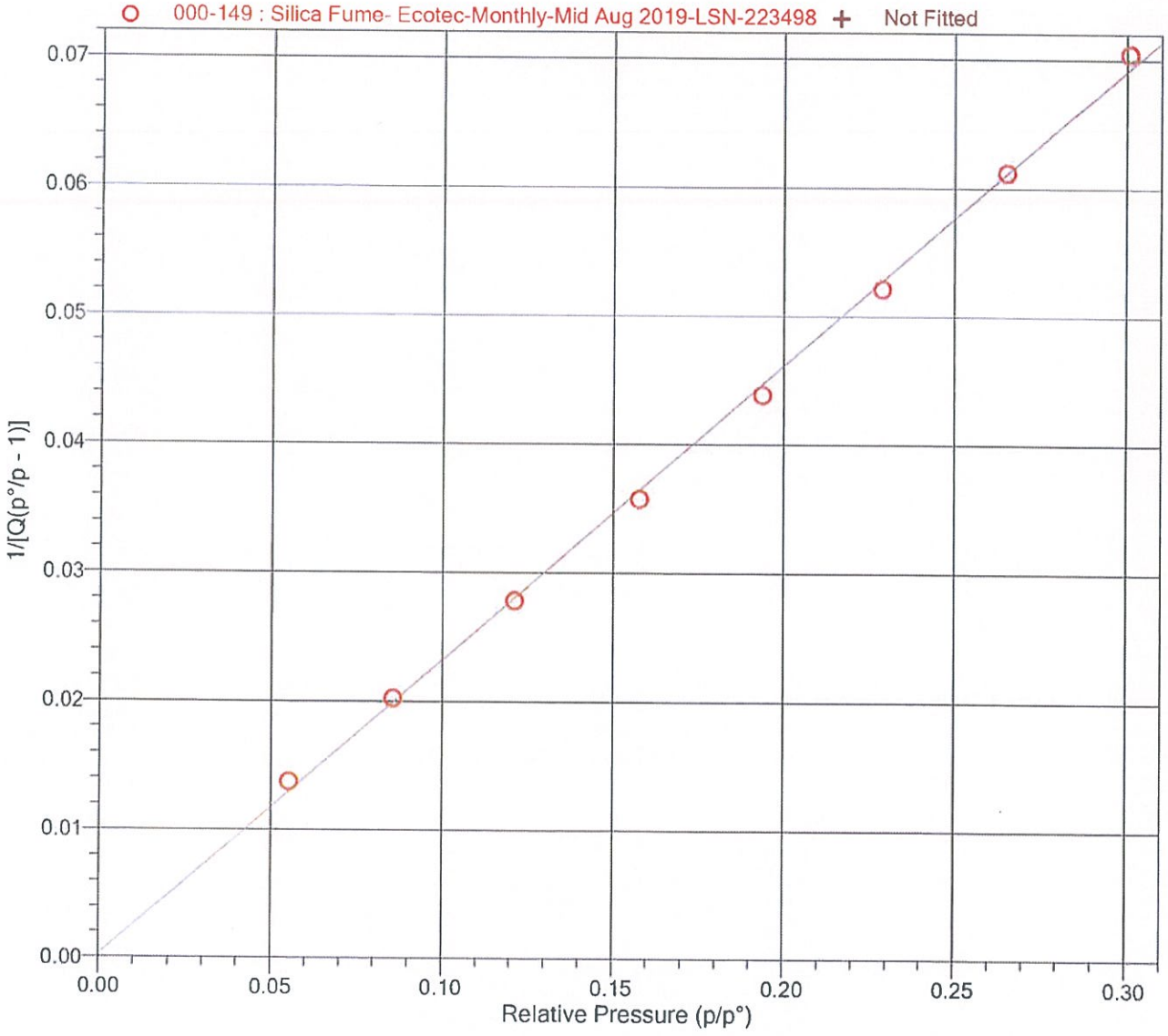
Analysis bath temp.: 77.350 K
Thermal correction: No
Warm free space: 18.5365 cm³ Measured
Equilibration interval: 15 s
Sample density: 1.000 g/cm³

BET Surface Area Plot



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Analysis bath temp.: 77.350 K
Thermal correction: No
Warm free space: 18.5365 cm³ Measured
Equilibration interval: 15 s
Sample density: 1.000 g/cm³

Langmuir Report

Langmuir surface area: 28.6715 ± 0.7178 m²/g
Slope: 0.151809 ± 0.003801 g/cm³ STP
Y-intercept: 4.254 ± 0.511 g/cm³ STP·mmHg
b: 0.035684 1/mmHg
Qm: 6.5872 cm³/g STP
Correlation coefficient: 0.998437
Molecular cross-sectional area: 0.1620 nm²

Pressure (mmHg)	Quantity Adsorbed (cm³/g STP)	p/Q (g/cm³ STP·mmHg)
42.876907	4.2645	10.054
66.319328	4.6287	14.328
93.909271	4.9529	18.960
122.305984	5.2362	23.358
150.154510	5.4773	27.414
177.403152	5.6927	31.163
205.665405	5.9013	34.851

Particle and Surface Sciences Pty. Limited

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