



**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: 256/20

LAB SAMPLE NO: 233738

DATE RECEIVED: 17/04/2020

REQUEST No: 88944

SAMPLE IDENTIFICATION: Ecotec Silica Fume – 2020 – HSXY-19

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	22/04/2020	2.30	AS 3583.5
Relative water requirement	23/04/2020	110%	AS 3583.6
Relative strength 7days (accelerated)	30/04/2020	113%	AS 3583.6

Note:

- Sample supplied by the client and tested as received.

Shaun Guthridge, Mat. File, File



Approved Signatory

Julius C. Alvaro

Julius Alvaro

Date 14/05/2020

Serial No.

CEM88944.JA.1

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This report shall not be reproduced except in full without the approval of the Boral MTS Laboratory
Test results in this Test Report relate only to the samples tested

NATA Accredited Laboratory

Number: 547



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TEST REPORT

CLIENT: XYPEX AUSTRALIA

FILE NO: 256/20

ADDRESS: 190 Toongabbie Road, Girraween, NSW 2145

REQUEST NO: 88944

LAB SAMPLE NO: 233738

SOURCE OF SAMPLE: Unknown

DATE RECEIVED: 17/04/2020

SAMPLE IDENTIFICATION: Ecotec Silica Fume – 2020 – HSXY-19

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: 05/05/2020

Date Crushed: 12/05/2020 @ 7 Days

Results:	Accelerated Pozzolanic Strength Activity Index:	112% @ 7 Days
	Control Mix Strength:	34.5 MPa
	Test Mix Strength:	38.6 MPa

Note:

Test mix used 242 mls of water and 1.9 grams of Dry Water Reducer (1000 NT from BASF) to obtain a flow of 100%.

Note:

- Sample supplied by the client and tested as received.

Shaun Guthridge, Mat. File, File



Approved Signatory

Julius C. Alvaro

Julius Alvaro

Date 14/05/2020

Serial No. CEM88944.JA.2

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TEST REPORT

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

FILE NO: 256/20

REQUEST NO: 88944

LAB. SAMPLE NO: 233738

SOURCE OF SAMPLE: Unknown

DATE RECEIVED: 17/04/2020

SAMPLE IDENTIFICATION: Ecotec Silica Fume – 2020 – HSXY- 19

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	30/04/2020	0.9%	AS 3583.2	Max. 3.0%
Loss on ignition	30/04/2020	1.9%	AS 3583.3	Max. 6.0%
Relative Density	22/04/2020	2.30	AS 3583.5	

Note:

- Sample supplied by the client and tested as received.

Shaun Guthridge, Mat. File, File



Approved Signatory Julius Alvaro
Date 14/05/2020 Serial No. CEM88944.JA.3

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TEST REPORT

CLIENT: XYPEX AUSTRALIA

FILE NO: 256/20

ADDRESS: 190 Toongabbie Road, Girraween, NSW 2145

REQUEST NO: 88944

LAB. SAMPLE NO: 233738

SOURCE OF SAMPLE: Unknown

DATE RECEIVED: 17/04/2020

SAMPLE IDENTIFICATION: Ecotec Silica Fume – 2020 – HSXY-19

PROPERTY	DATE TESTED	RESULT	TEST METHOD
Bulk Density	12/05/2020	707 Kg/m ³	AS3582.3 – Clause 7.1.7

Notes:

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Shaun Guthridge, Mat. File, File


Julius Alvaro
14/05/2020



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TEST REPORT

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

FILE No.: 256/20

PROJECT: Testing of Silica Fume sample for 2020-HSXY-19.

REQUEST No.: 88944

TEST PROCEDURE:

AS 3583.12 – 1991 – Determination of Available Alkali

Laboratory Sample No.: 233738
Date Sampled: Unknown
Date Received: 17/04/20
Date Tested: 20/05/20
Sample Description: Ecotec Silca Fume 2020 HSXY-19.
Field No.: 1

TEST RESULTS:

Sodium as Na ₂ O (%)	0.15
Potassium as K ₂ O (%)	0.12
Available Alkali (%)	0.2

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

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

Nanthini Selvadurai

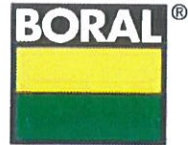
Date 21-05-20

Serial No. CHEM88944.NS.1

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TEST REPORT

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

FILE No.:256/20

PROJECT: Testing of Silica Fume sample for 2020 –HSXY-19.

REQUEST No.:88944

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

Laboratory Sample No.: 233738
Date Sampled: Unknown
Date Received: 17/04/20
Date Tested: 27/04/20 to 07/05/20
Sample Description: Ecotec Silca Fume 2020-
HSXY -19.
Field No.: 1

TEST RESULTS:

Chloride as Cl⁻ (%) 0.117
Sulphate as SO₃ (%) 0.3

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

Nanthini Selvadurai

Date 21-05-20

Serial No.

CHEM88944.NS.2

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NATA Accredited Laboratory

Number: 9968



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TEST REPORT

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

FILE No.: 256/20

PROJECT: Testing of Silica fume sample for 2020 HSXY-19.

REQUEST No.: 88944

TEST PROCEDURE: Boral In house Method 34 – Determination of metal oxides by XRF Flux (66:34) Fusion Bead and analysed using XRF

Laboratory Sample No.: 233738
Date Sampled: Unknown
Date Received: 17/04/20
Sample Description: Ecotec Silica Fume –
2020 HSXY-19.
Field No.: 1

TEST RESULTS

Silicon as SiO ₂ (%)	87.1
Sodium as Na ₂ O (%)	0.90
Potassium as K ₂ O (%)	1.28
Total Alkali content as Na ₂ O equiv. (%)	1.7

Sample submitted by the Client.

Nanthini S
Analytical Chemist
21st May 2020.
S.Guthridge, Mat. File, File.



TriStar 3000 V6.08 A

Unit 1 Port 2

Serial #: 1586

Page 1

Sample: Ecotec Silica Fume 2020 HSXY 19 LSN 233738
Operator: MG
Submitter: Boral
File: Y:\...\TRISTAR\000-102.SMP

Started: 6/05/2020 1:00:24PM
Completed: 6/05/2020 5:08:53PM
Report Time: 7/05/2020 10:12:47AM
Warm Free Space: 17.4821 cm³ Measured
Equilibration Interval: 15 s
Sample Density: 1.000 g/cm³

Analysis Adsorptive: N2
Analysis Bath Temp.: 77.300 K
Sample Mass: 0.7160 g
Cold Free Space: 48.3488 cm³ Measured
Low Pressure Dose: None
Automatic Degas: No

Isotherm Tabular Report

Relative Pressure (P/Po)	Absolute Pressure (mmHg)	Quantity Adsorbed (cm ³ /g STP)	Elapsed Time (h:min)	Saturation Pressure (mmHg)
			02:58	779.58862
0.024423474	19.04026	3.2114	03:33	
0.032384341	25.24646	3.3968	03:40	
0.053917564	42.03352	3.7096	03:45	
0.097254435	75.81845	4.1130	03:50	
0.149566304	116.60019	4.4591	03:55	
0.199909084	155.84685	4.7327	03:58	
0.250192715	195.04739	4.9867	04:02	
0.300594643	234.34016	5.2347	04:06	



TriStar 3000 V6.08 A

Unit 1 Port 2

Serial #: 1586

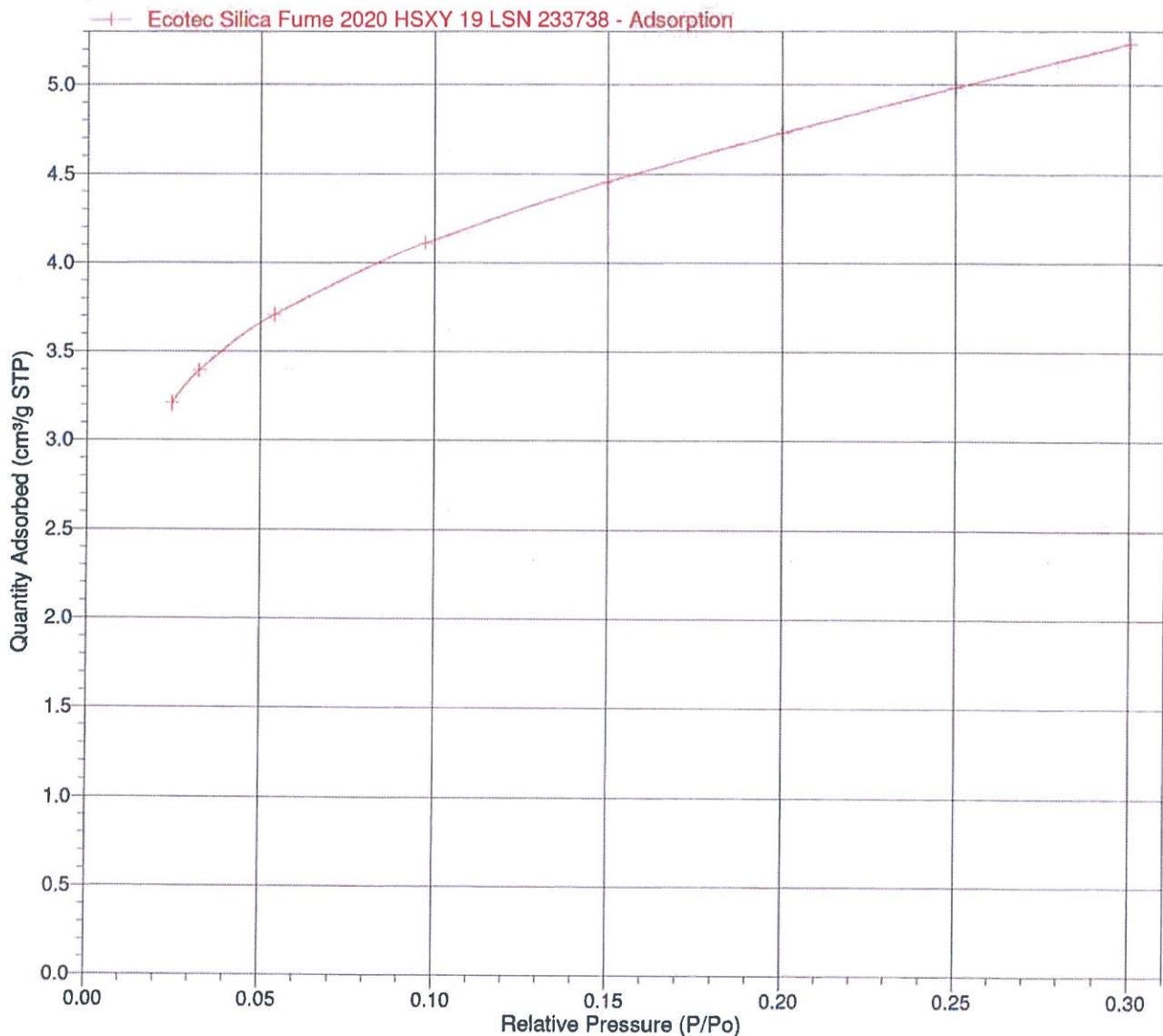
Page 2

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Equilibration Interval: 15 s
Sample Density: 1.000 g/cm³

Analysis Adsorptive: N₂
Analysis Bath Temp.: 77.300 K
Sample Mass: 0.7160 g
Cold Free Space: 48.3488 cm³ Measured
Low Pressure Dose: None
Automatic Degas: No

Isotherm Linear Plot





TriStar 3000 V6.08 A

Unit 1 Port 2

Serial #: 1586

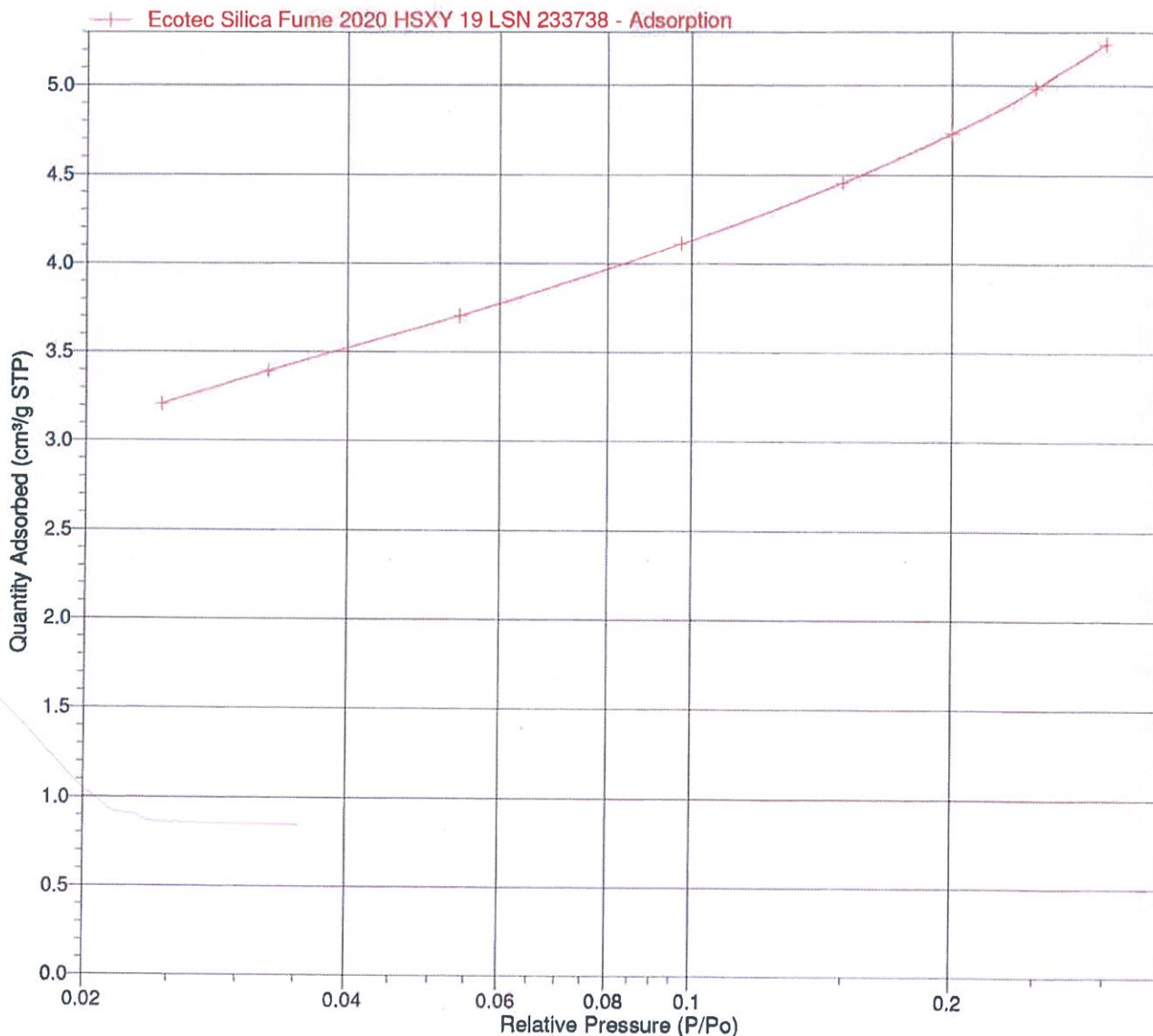
Page 3

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Analysis Bath Temp.: 77.300 K
Sample Mass: 0.7160 g
Cold Free Space: 48.3488 cm³ Measured
Low Pressure Dose: None
Automatic Degas: No

Isotherm Log Plot





TriStar 3000 V6.08 A

Unit 1 Port 2

Serial #: 1586

Page 4

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Analysis Adsorptive: N2
Analysis Bath Temp.: 77.300 K
Sample Mass: 0.7160 g
Cold Free Space: 48.3488 cm³ Measured
Low Pressure Dose: None
Automatic Degas: No

BET Surface Area Report

BET Surface Area: 16.5645 ± 0.2305 m²/g
Slope: 0.262008 ± 0.003608 g/cm³ STP
Y-Intercept: 0.000795 ± 0.000598 g/cm³ STP
C: 330.419203
Qm: 3.8051 cm³/g STP
Correlation Coefficient: 0.9997157
Molecular Cross-Sectional Area: 0.1620 nm²

Relative Pressure (P/Po)	Quantity Adsorbed (cm ³ /g STP)	1/[Q(Po/P - 1)]
0.053917564	3.7096	0.015363
0.097254435	4.1130	0.026193
0.149566304	4.4591	0.039440
0.199909084	4.7327	0.052794
0.250192715	4.9867	0.066913



TriStar 3000 V6.08 A

Unit 1 Port 2

Serial #: 1586

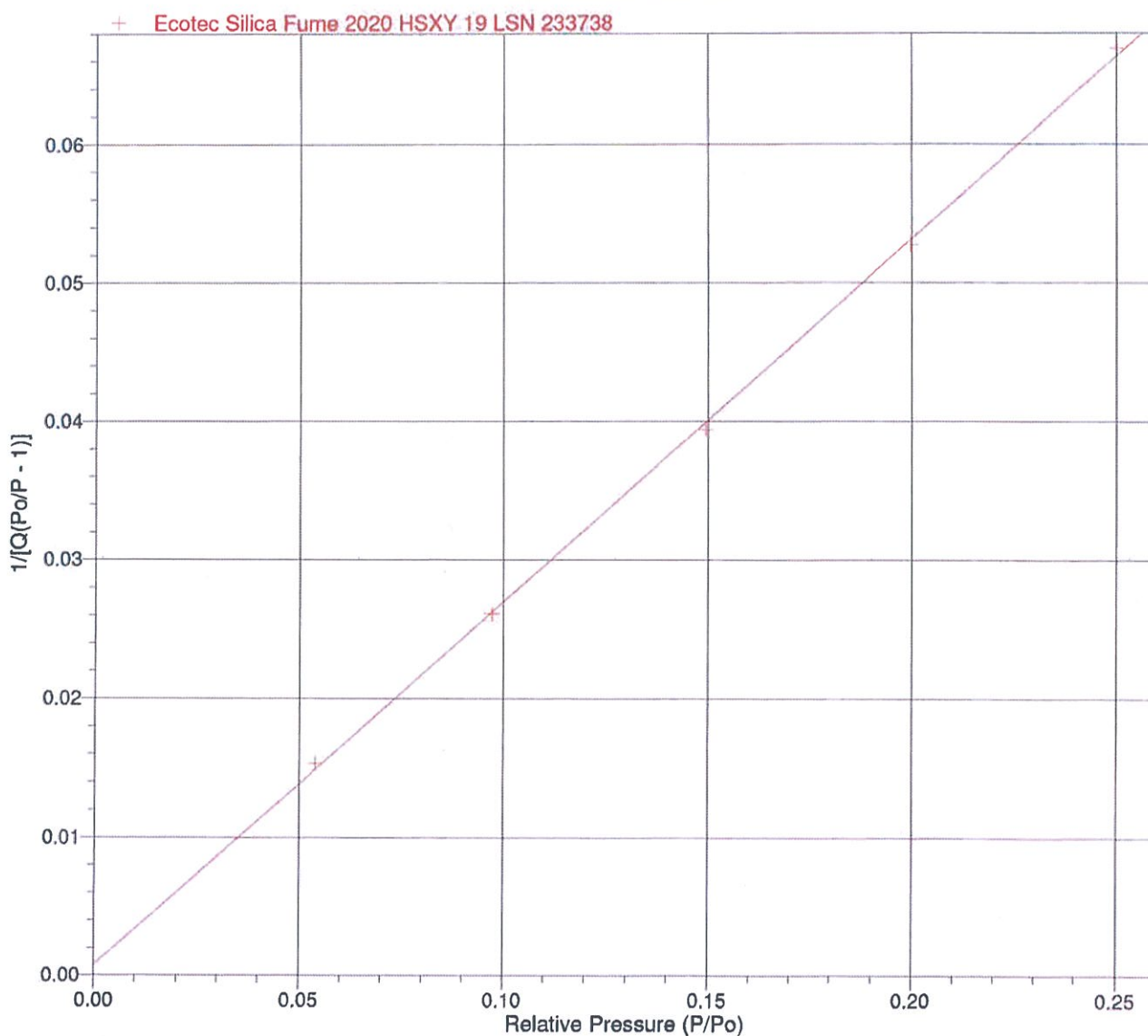
Page 5

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Analysis Adsorptive: N2
Analysis Bath Temp.: 77.300 K
Sample Mass: 0.7160 g
Cold Free Space: 48.3488 cm³ Measured
Low Pressure Dose: None
Automatic Degas: No

BET Surface Area Plot





TriStar 3000 V6.08 A

Unit 1 Port 2

Serial #: 1586

Page 6

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Analysis Adsorptive: N2
Analysis Bath Temp.: 77.300 K
Sample Mass: 0.7160 g
Cold Free Space: 48.3488 cm³ Measured
Low Pressure Dose: None
Automatic Degas: No

Langmuir Surface Area Report

Langmuir Surface Area: 21.9997 ± 0.5581 m²/g
Slope: 0.197875 ± 0.005020 g/cm³ STP
Y-Intercept: 2.701778 ± 0.441470 mmHg·g/cm³ STP
b: 0.073239 1/mmHg
Qm: 5.0537 cm³/g STP
Correlation Coefficient: 0.998715
Molecular Cross-Sectional Area: 0.1620 nm²

Pressure (mmHg)	Quantity Adsorbed (cm ³ /g STP)	P/Q (mmHg·g/cm ³ STP)
19.04026	3.2114	5.929
25.24646	3.3968	7.432
42.03352	3.7096	11.331
75.81845	4.1130	18.434
116.60019	4.4591	26.149
155.84685	4.7327	32.930



TriStar 3000 V6.08 A

Unit 1 Port 2

Serial #: 1586

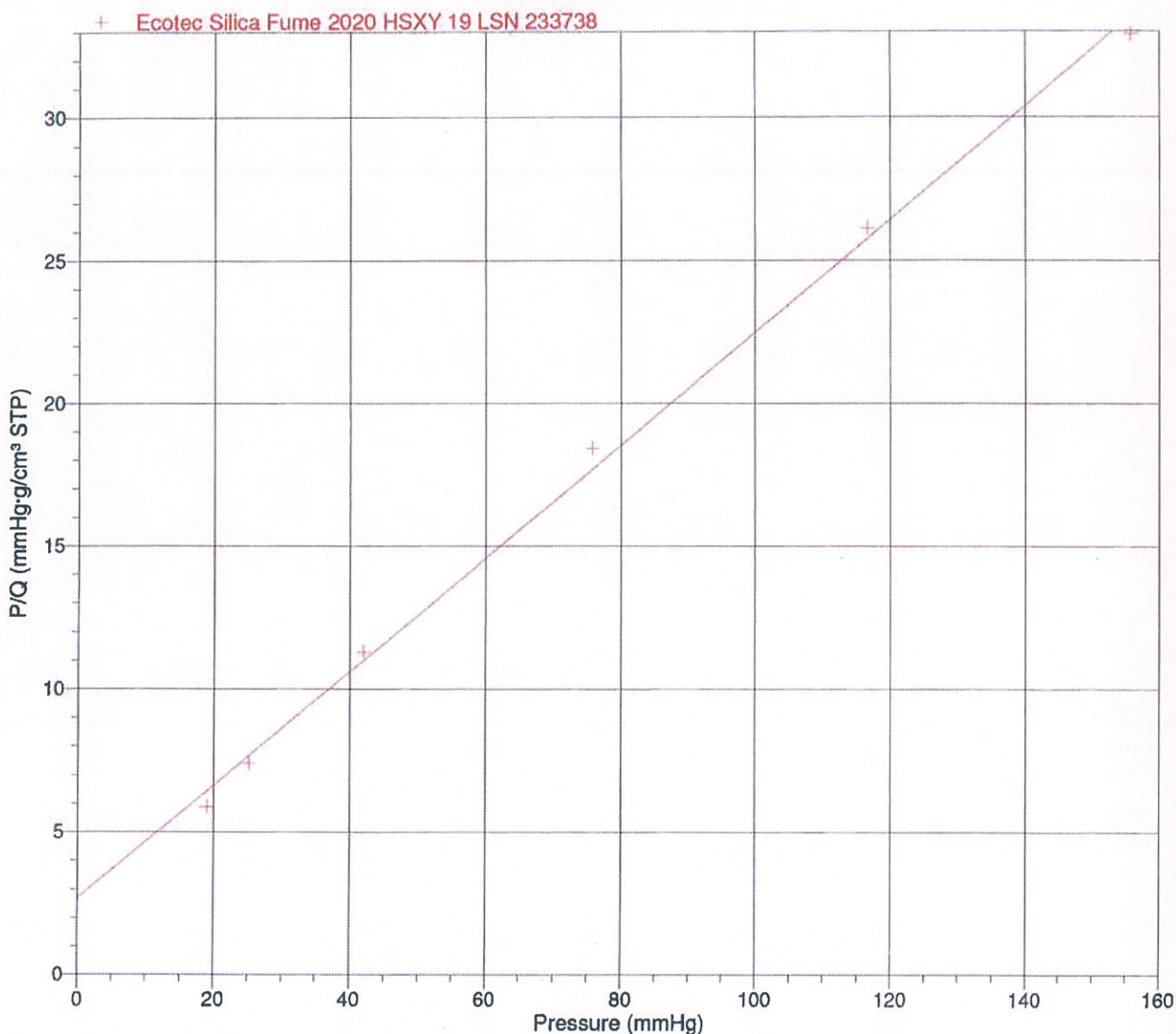
Page 7

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Sample Mass: 0.7160 g
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Low Pressure Dose: None
Automatic Degas: No

Langmuir Surface Area Plot





TriStar 3000 V6.08 A

Unit 1 Port 2

Serial #: 1586

Page 8

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Cold Free Space: 48.3488 cm³ Measured
Low Pressure Dose: None
Automatic Degas: No

Summary Report

Surface Area

Single point surface area at P/Po = 0.250192715: 16.2770 m²/g

BET Surface Area: 16.5645 m²/g

Langmuir Surface Area: 21.9997 m²/g