



**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:** 233739

**DATE RECEIVED:** 17/04/2020

**REQUEST No:** 88945

**SAMPLE IDENTIFICATION:** Ecotec Silica Fume – 2020 – HSXY- 20

**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	29/04/2020	2.28	AS 3583.5
Relative water requirement	30/04/2020	110%	AS 3583.6
Relative strength 7days (accelerated)	07/05/2020	118%	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. CEM88945.JA.1

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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:** 88945

**LAB SAMPLE NO:** 233739

**SOURCE OF SAMPLE:** Unknown

**DATE RECEIVED:** 17/04/2020

**SAMPLE IDENTIFICATION:** Ecotec Silica Fume – 2020 – HSXY- 20

**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:  
Control Mix Strength:  
Test Mix Strength:

121% @ 7 Days  
34.5 MPa  
41.8 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 109%.

**Note:**

- Sample supplied by the client and tested as received.

Shaun Guthridge, Mat. File, File



Approved Signatory

*Julius Alvaro*

Julius Alvaro

Date 14/05/2020

Serial No.

CEM88945.JA.2

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**TEST REPORT**

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Address: 190 Toongabbie Road, Girraween, NSW 2145

**FILE NO:** 256/20

**REQUEST NO:** 88945

**LAB. SAMPLE NO:** 233739

**SOURCE OF SAMPLE:** Unknown

**DATE RECEIVED:** 17/04/2020

**SAMPLE IDENTIFICATION:** Ecotec Silica Fume – 2020 – HSXY- 20

**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	07/05/2020	0.6%	AS 3583.2	Max. 3.0% Max. 6.0%
Loss on ignition	07/05/2020	1.8%	AS 3583.3	
Relative Density	29/04/2020	2.28	AS 3583.5	

**Note:**

- Sample supplied by the client and tested as received.

Shaun Guthridge, Mat. File, File

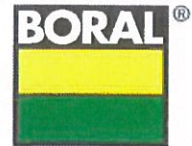


Approved Signatory Julius Alvaro  
 Date 14/05/2020 Serial No. CEM88945.JA.3

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**TEST REPORT**

**CLIENT:** XYPEX AUSTRALIA

**FILE NO:** 256/20

**ADDRESS:** 190 Toongabbie Road, Girraween, NSW 2145

**REQUEST NO:** 88945

**LAB. SAMPLE NO:** 233739

**SOURCE OF SAMPLE:** Unknown

**DATE RECEIVED:** 17/04/2020

**SAMPLE IDENTIFICATION:** Ecotec Silica Fume – 2020 – HSXY-20

PROPERTY	DATE TESTED	RESULT	TEST METHOD
Bulk Density	12/05/2020	705 Kg/m <sup>3</sup>	AS3582.3 – Clause 7.1.7

**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

  
Julius Alvaro  
4/05/2020



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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-20.

REQUEST No.: 88945

**TEST PROCEDURE:**

AS 3583.12 – 1991 – Determination of Available Alkali

Laboratory Sample No.: 233739  
Date Sampled: Unknown  
Date Received: 17/04/20  
Date Tested: 20/05/20  
Sample Description: Ecotec Silca Fume 2020 HSXY-20  
Field No.: 1

**TEST RESULTS:**

Sodium as Na<sub>2</sub>O (%) 0.17  
Potassium as K<sub>2</sub>O (%) 0.15  
Available Alkali (%) 0.3

Available Alkali (%) = Na<sub>2</sub>O (%) + (0.658 x K<sub>2</sub>O %)

**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

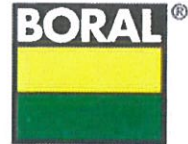
Date 21-05-20

Serial No. CHEM88945.NS.1

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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-20.

REQUEST No.:88945

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

Laboratory Sample No.: 233739  
Date Sampled: Unknown  
Date Received: 17/04/20  
Date Tested: 04/05/20 to 07/05/20  
Sample Description: Ecotec Silca Fume 2020-  
HSXY -20.  
Field No.: 1

**TEST RESULTS:**

Chloride as Cl<sup>-</sup> (%) 0.150  
Sulphate as SO<sub>3</sub> (%) 0.2

**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.

CHEM88945.NS.2

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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-20.

REQUEST No.: 88945

**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.:	233739
Date Sampled:	Unknown
Date Received:	17/04/20
Sample Description:	Ecotec Silica Fume – 2020 HSXY-20.
Field No.:	1

**TEST RESULTS**

Silicon as SiO <sub>2</sub> (%)	88.9
Sodium as Na <sub>2</sub> O (%)	0.83
Potassium as K <sub>2</sub> O (%)	1.44
Total Alkali content as Na <sub>2</sub> O equiv. (%)	1.8

Sample submitted by the Client.

A handwritten signature in black ink, appearing to read "Nanthini S".

Nanthini S  
Analytical Chemist  
21<sup>st</sup> May 2020.  
S.Guthridge, Mat. File, File.



TriStar 3000 V6.08 A

Unit 1 Port 3

Serial #: 1586

Page 1

Sample: Ecotec Silica Fume 2020 HSXY 20 LSN 233739
Operator: MG
Submitter: Boral
File: Y:\...\TRISTAR\000-101.SMP

Started: 6/05/2020 1:00:24PM
Completed: 6/05/2020 5:08:53PM
Report Time: 7/05/2020 10:10:28AM
Warm Free Space: 17.4980 cm³ Measured
Equilibration Interval: 15 s
Sample Density: 1.000 g/cm³
Analysis Adsorptive: N2
Analysis Bath Temp.: 77.300 K
Sample Mass: 0.6810 g
Cold Free Space: 48.4571 cm³ Measured
Low Pressure Dose: None
Automatic Degas: No

Isotherm Tabular Report

Table with 5 columns: Relative Pressure (P/Po), Absolute Pressure (mmHg), Quantity Adsorbed (cm³/g STP), Elapsed Time (h:min), Saturation Pressure (mmHg). It contains 8 rows of data points.



TriStar 3000 V6.08 A

Unit 1 Port 3

Serial #: 1586

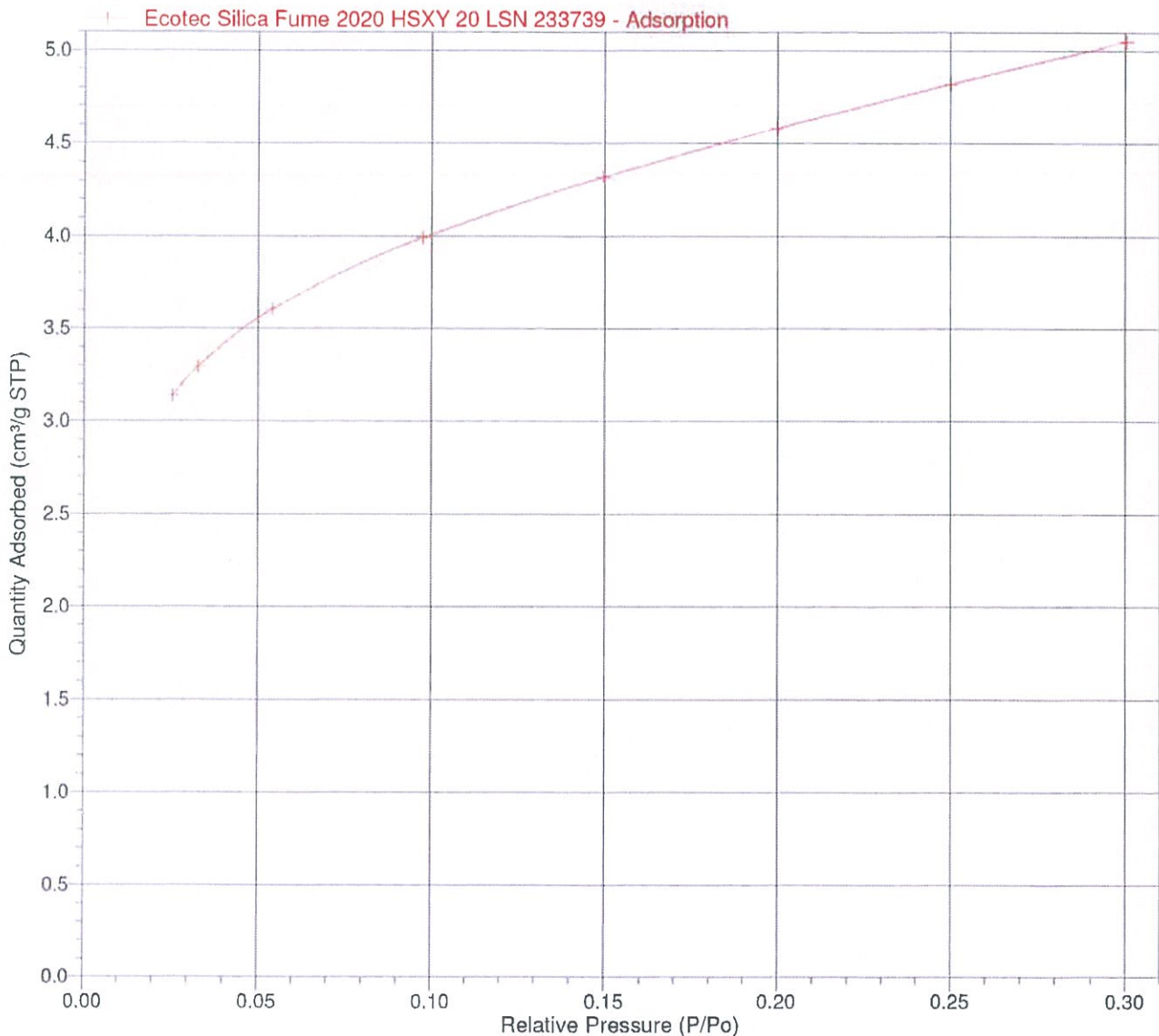
Page 2

Sample: Ecotec Silica Fume 2020 HSXY 20 LSN 233739  
Operator: MG  
Submitter: Boral  
File: Y:\...\TRISTAR\000-101.SMP

Started: 6/05/2020 1:00:24PM  
Completed: 6/05/2020 5:08:53PM  
Report Time: 7/05/2020 10:10:28AM  
Warm Free Space: 17.4980 cm<sup>3</sup> Measured  
Equilibration Interval: 15 s  
Sample Density: 1.000 g/cm<sup>3</sup>

Analysis Adsorptive: N<sub>2</sub>  
Analysis Bath Temp.: 77.300 K  
Sample Mass: 0.6810 g  
Cold Free Space: 48.4571 cm<sup>3</sup> Measured  
Low Pressure Dose: None  
Automatic Degas: No

Isotherm Linear Plot





TriStar 3000 V6.08 A

Unit 1 Port 3

Serial #: 1586

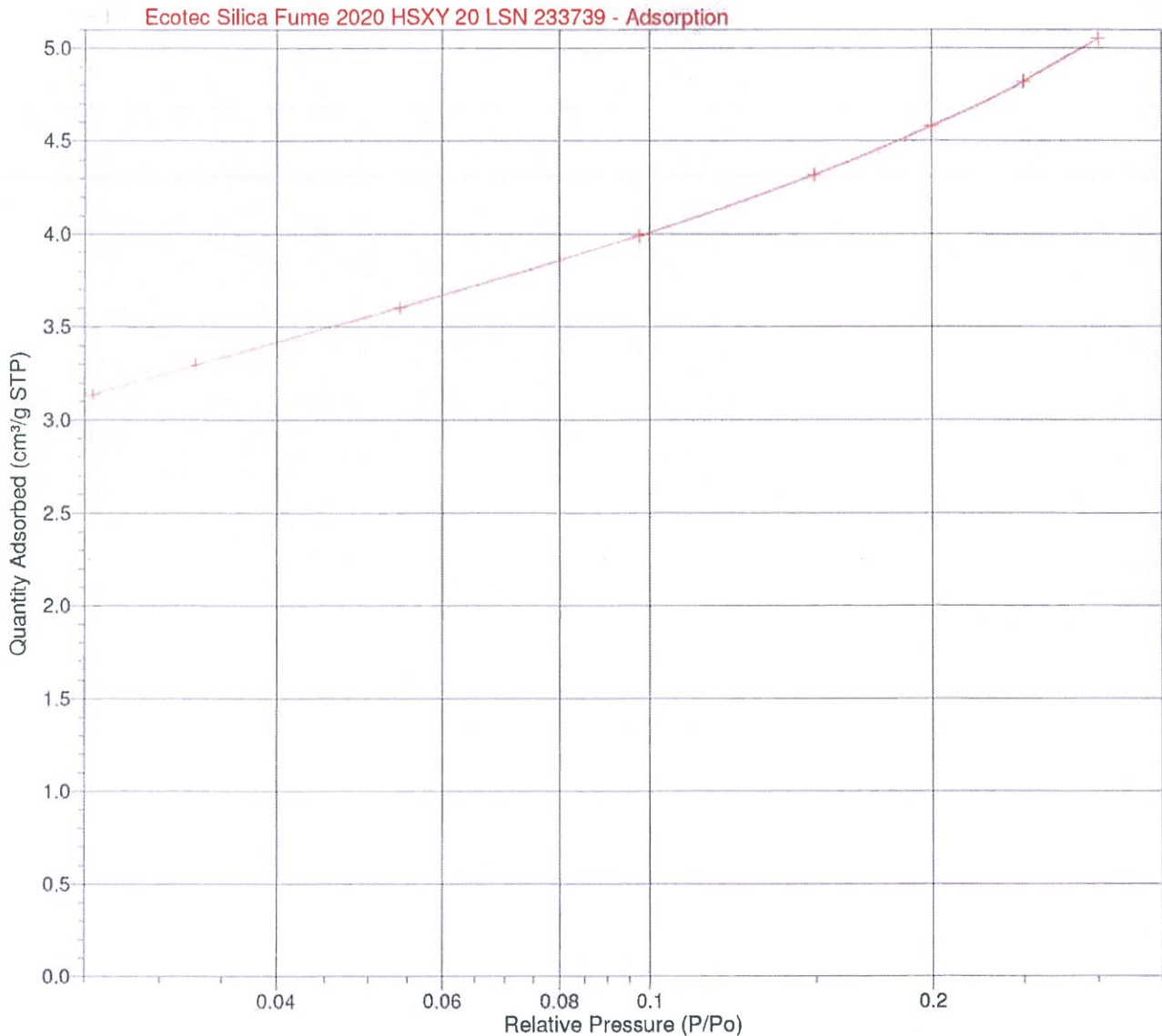
Page 3

Sample: Ecotec Silica Fume 2020 HSXY 20 LSN 233739  
Operator: MG  
Submitter: Boral  
File: Y:\...\TRISTAR\000-101.SMP

Started: 6/05/2020 1:00:24PM  
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Report Time: 7/05/2020 10:10:28AM  
Warm Free Space: 17.4980 cm<sup>3</sup> Measured  
Equilibration Interval: 15 s  
Sample Density: 1.000 g/cm<sup>3</sup>

Analysis Adsorptive: N2  
Analysis Bath Temp.: 77.300 K  
Sample Mass: 0.6810 g  
Cold Free Space: 48.4571 cm<sup>3</sup> Measured  
Low Pressure Dose: None  
Automatic Degas: No

### Isotherm Log Plot





TriStar 3000 V6.08 A

Unit 1 Port 3

Serial #: 1586

Page 4

Sample: Ecotec Silica Fume 2020 HSXY 20 LSN 233739  
Operator: MG  
Submitter: Boral  
File: Y:\...\TRISTAR\000-101.SMP

Started: 6/05/2020 1:00:24PM Analysis Adsorptive: N2  
Completed: 6/05/2020 5:08:53PM Analysis Bath Temp.: 77.300 K  
Report Time: 7/05/2020 10:10:28AM Sample Mass: 0.6810 g  
Warm Free Space: 17.4980 cm<sup>3</sup> Measured Cold Free Space: 48.4571 cm<sup>3</sup> Measured  
Equilibration Interval: 15 s Low Pressure Dose: None  
Sample Density: 1.000 g/cm<sup>3</sup> Automatic Degas: No

**BET Surface Area Report**

BET Surface Area: 15.9965 ± 0.2327 m<sup>2</sup>/g  
Slope: 0.271429 ± 0.003905 g/cm<sup>3</sup> STP  
Y-Intercept: 0.000706 ± 0.000647 g/cm<sup>3</sup> STP  
C: 385.575414  
Qm: 3.6746 cm<sup>3</sup>/g STP  
Correlation Coefficient: 0.9996896  
Molecular Cross-Sectional Area: 0.1620 nm<sup>2</sup>

Relative Pressure (P/Po)	Quantity Adsorbed (cm <sup>3</sup> /g STP)	1/[Q(Po/P - 1)]
0.054074612	3.6040	0.015862
0.097485894	3.9905	0.027068
0.149588050	4.3184	0.040733
0.199864184	4.5802	0.054537
0.250140298	4.8196	0.069214



TriStar 3000 V6.08 A

Unit 1 Port 3

Serial #: 1586

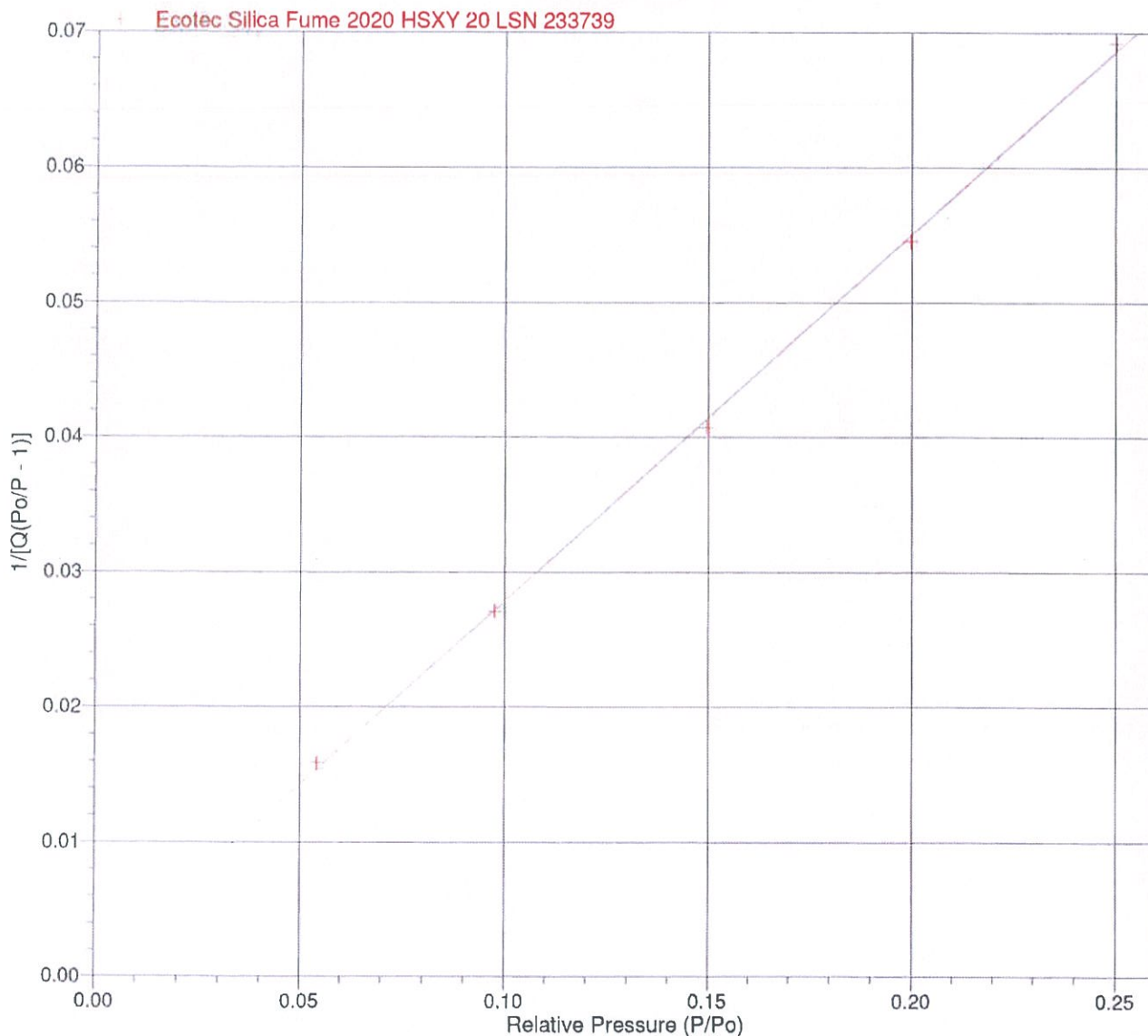
Page 5

Sample: Ecotec Silica Fume 2020 HSXY 20 LSN 233739  
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Submitter: Boral  
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Equilibration Interval: 15 s  
Sample Density: 1.000 g/cm<sup>3</sup>

Analysis Adsorptive: N2  
Analysis Bath Temp.: 77.300 K  
Sample Mass: 0.6810 g  
Cold Free Space: 48.4571 cm<sup>3</sup> Measured  
Low Pressure Dose: None  
Automatic Degas: No

BET Surface Area Plot





TriStar 3000 V6.08 A

Unit 1 Port 3

Serial #: 1586

Page 6

Sample: Ecotec Silica Fume 2020 HSXY 20 LSN 233739
Operator: MG
Submitter: Boral
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Warm Free Space: 17.4980 cm³ Measured
Equilibration Interval: 15 s
Sample Density: 1.000 g/cm³
Analysis Adsorptive: N2
Analysis Bath Temp.: 77.300 K
Sample Mass: 0.6810 g
Cold Free Space: 48.4571 cm³ Measured
Low Pressure Dose: None
Automatic Degas: No

Langmuir Surface Area Report

Langmuir Surface Area: 21.3100 ± 0.5191 m²/g
Slope: 0.204280 ± 0.004976 g/cm³ STP
Y-Intercept: 2.797785 ± 0.437937 mmHg·g/cm³ STP
b: 0.073015 1/mmHg
Qm: 4.8953 cm³/g STP
Correlation Coefficient: 0.998815
Molecular Cross-Sectional Area: 0.1620 nm²

Table with 3 columns: Pressure (mmHg), Quantity Adsorbed (cm³/g STP), P/Q (mmHg·g/cm³ STP). Rows contain numerical data points.



TriStar 3000 V6.08 A

Unit 1 Port 3

Serial #: 1586

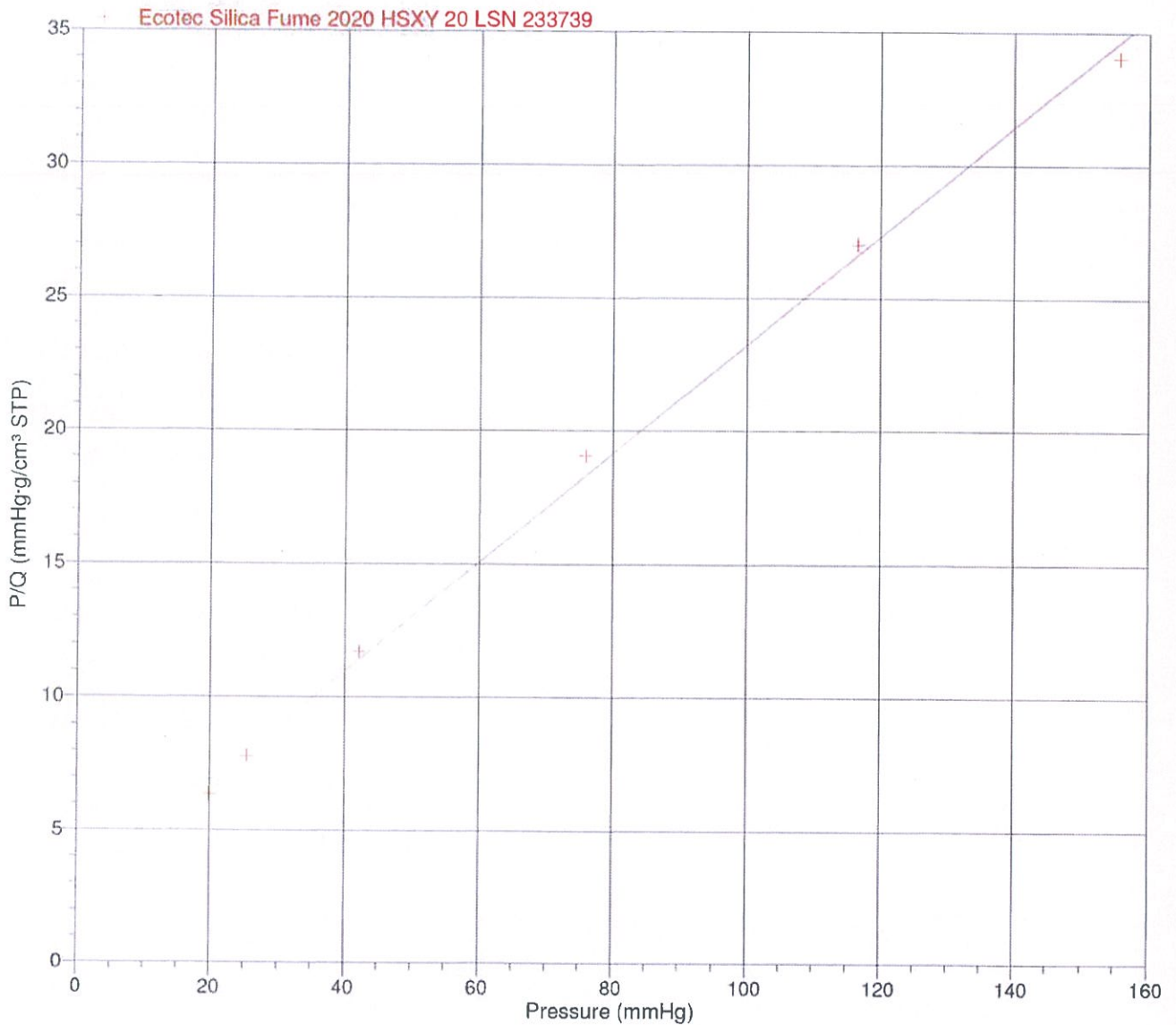
Page 7

Sample: Ecotec Silica Fume 2020 HSXY 20 LSN 233739  
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Equilibration Interval: 15 s  
Sample Density: 1.000 g/cm<sup>3</sup>

Analysis Adsorptive: N2  
Analysis Bath Temp.: 77.300 K  
Sample Mass: 0.6810 g  
Cold Free Space: 48.4571 cm<sup>3</sup> Measured  
Low Pressure Dose: None  
Automatic Degas: No

### Langmuir Surface Area Plot





TriStar 3000 V6.08 A

Unit 1 Port 3

Serial #: 1586

Page 8

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Operator: MG  
Submitter: Boral  
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Sample Density: 1.000 g/cm<sup>3</sup>

Analysis Adsorptive: N2  
Analysis Bath Temp.: 77.300 K  
Sample Mass: 0.6810 g  
Cold Free Space: 48.4571 cm<sup>3</sup> Measured  
Low Pressure Dose: None  
Automatic Degas: No

### Summary Report

#### Surface Area

Single point surface area at P/Po = 0.250140298: 15.7325 m<sup>2</sup>/g

BET Surface Area: 15.9965 m<sup>2</sup>/g

Langmuir Surface Area: 21.3100 m<sup>2</sup>/g