



**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

**FILE NO:** 256/18

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

**REQUEST NO:** 79842

**LAB SAMPLE NO:** 208680

**SOURCE OF SAMPLE:** Unknown

**SAMPLE IDENTIFICATION:** Ecotec Silica Fume – Monthly Sample for Mid August 2018

**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:** 11-10-2018

**Date Crushed:** 17-10-2018 @ 7 Days

**Results:** Accelerated Pozzolanic Strength Activity Index:  
Control Mix Strength:  
Test Mix Strength:

**118% @ 7 Days  
33.1 MPa  
38.9 MPa**

**Note:**

Test mix used 242 mls of water and 1.8 grams of Dry Water Reducer (1000 NT from BASF) to obtain a flow of 100 %.

Shaun Guthridge, Mat. File, File



ACCREDITED FOR  
TECHNICAL  
COMPETENCE

Approved Signatory

**Julius Alvaro**

Date 18/10/18

Serial No.

173236

Accredited for compliance with ISO/IEC 17025

NATA Accredited Laboratory

Number: 547



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**SAMPLE IDENTIFICATION:** Ecotec Silica Fume – Monthly Sample for Mid August 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	31/08/2018	2.20	AS 3583.5
Relative water requirement	20/09/2018	109%	AS 3583.6
Relative strength 7days (accelerated)	27/09/2018	114%	AS 3583.6
Relative strength 28days (standard)	18/10/2018	99%	AS 3583.6

Shaun Guthridge, Mat. File, File



Approved Signatory Julius C. Alvaro **Julius Alvaro**  
 Date 18/10/18 Serial No. 173237

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Address: 190 Toongabbie Road Girraween, NSW 2145

**FILE NO:** 256/18

**REQUEST NO:** 79842

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**SOURCE OF SAMPLE:** Unknown

**SAMPLE IDENTIFICATION:** Ecotec Silica Fume – Monthly Sample for Mid August 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	17/10/2018	0.7%	AS 3583.2	Max. 3.0%
Loss on ignition	17/10/2018	2.4%	AS 3583.3	Max. 6.0%
Relative Density	31/08/2018	2.20	AS 3583.5	

Sample submitted by the client.

Shaun Guthridge, Mat. File, File



Approved Signatory

*Julius Alvaro* Julius Alvaro

Date 19/10/18

Serial No. 173238

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**TEST REPORT**

**CLIENT:** XYPEX AUSTRALIA

**FILE NO:** 256/18

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

**REQUEST NO:** 79842

**LAB. SAMPLE NO:** 208680

**SOURCE OF SAMPLE:** Unknown

**SAMPLE IDENTIFICATION:** Ecotec Silica Fume – Monthly Sample for Mid August 2018

**Bulk Density - AS3582.3 – Clause 7.1.7**

**Result:** 651 Kg/m<sup>3</sup>

Shaun Guthridge, Mat. File, File

  
Julius Alvaro  
18/10/2018



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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 Mid.August .2018.

REQUEST No.: 79842

**TEST PROCEDURE:**

AS 3583.12 – 1991 – Determination of Available Alkali

Laboratory Sample No.: 208680  
Date Sampled: Mid.August' 2018  
Date Received: 16/08/18  
Sample Description: Ecotec Silca Fume –  
Monthly Sample for  
Mid.August 2018.  
Field No.: 1

**TEST RESULTS:**

Sodium as Na <sub>2</sub> O (%)	0.06
Potassium as K <sub>2</sub> O (%)	0.14
Available Alkali (%)	0.2

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

Samples submitted by the Client.

S.Guthridge, Mat. File, File.



Approved Signatory: NOS Nanthini Selvadurai  
Date 21-09-18 Serial No. 173239



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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 Mid. August' 2018.

REQUEST No.: 79842

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

Laboratory Sample No.: 208680  
Date Sampled: Mid.August' 2018.  
Date Received: 16/08/18  
Sample Description: Ecotec Silica Fume  
Mid.August 2018.  
Field No.: 1

**TEST RESULTS**

Silicon as SiO<sub>2</sub> (%) 95.8

Sample submitted by the Client.

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

Nanthini S  
Analytical Chemist  
21<sup>th</sup> September 2018.  
S.Guthridge, Mat. File, File.



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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 Mid.August' 2018

REQUEST No.: 79842

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

Laboratory Sample No.: 208680  
Date Sampled: Mid.August'2018  
Date Received: 16/08/18  
Sample Description: Ecotec Silca Fume  
monthly sample for  
Mid.August' 2018.  
Field No.: 1

**TEST RESULTS:**

Chloride as Cl<sup>-</sup> (%) 0.0053  
Sulphate as SO<sub>3</sub> (%) 1.2

Samples submitted by the Client.

S.Guthridge, Mat. File, File.



Approved Signatory

Nanthini Selvadurai

Date 21-09-18

Serial No.

173240



# 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

MicroActive 4.02

3000  
Serial # 1586 Unit 1 Port 1

Page 1 of 8

Sample: 208680  
Operator: KW  
Submitter: Boral  
File: \\192.168.0.110\Public\PsS\Customers\L1...\1000-075.SMP

Started: 3/04/2006 11:20:59 PM	Analysis adsorptive: N2
Completed: 4/04/2006 2:15:08 AM	Analysis bath temp.: 77.323 K
Report time: 25/10/2018 3:27:57 PM	Thermal correction: No
Sample mass: 1.6014 g	Warm free space: 12.0041 cm <sup>3</sup> Measured
Cold free space: 31.3704 cm <sup>3</sup>	Equilibration interval: 15 s
Low pressure dose: None	Sample density: 1.000 g/cm <sup>3</sup>
Automatic degas: No	

## Summary Report

### Surface Area

Single point surface area at  $p/p^{\circ} = 0.149630636$ : 17.6008 m<sup>2</sup>/g

BET Surface Area: 17.9714 m<sup>2</sup>/g

Langmuir Surface Area: 25.3143 m<sup>2</sup>/g





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Serial # 1586 Unit 1 Port 1

Page 2 of 8

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Automatic degas: No	

## Isotherm Tabular Report

Relative Pressure (p/p°)	Absolute Pressure (mmHg)	Quantity Adsorbed (cm <sup>3</sup> /g STP)	Elapsed Time (h:min)	Saturation Pressure (mmHg)
			01:54	757.416443
0.025503420	19.316710	3.2744	02:06	
0.030359131	22.994505	3.3934	02:10	
0.053386577	40.435871	3.8103	02:16	
0.108260491	81.998276	4.4206	02:23	
0.149240943	113.037544	4.7531	02:28	
0.199985318	151.472168	5.1069	02:32	
0.251167129	190.238113	5.4343	02:37	
0.302698914	229.269135	5.7499	02:42	



MicroActive 4.02

3000  
Serial # 1586 Unit 1 Port 1

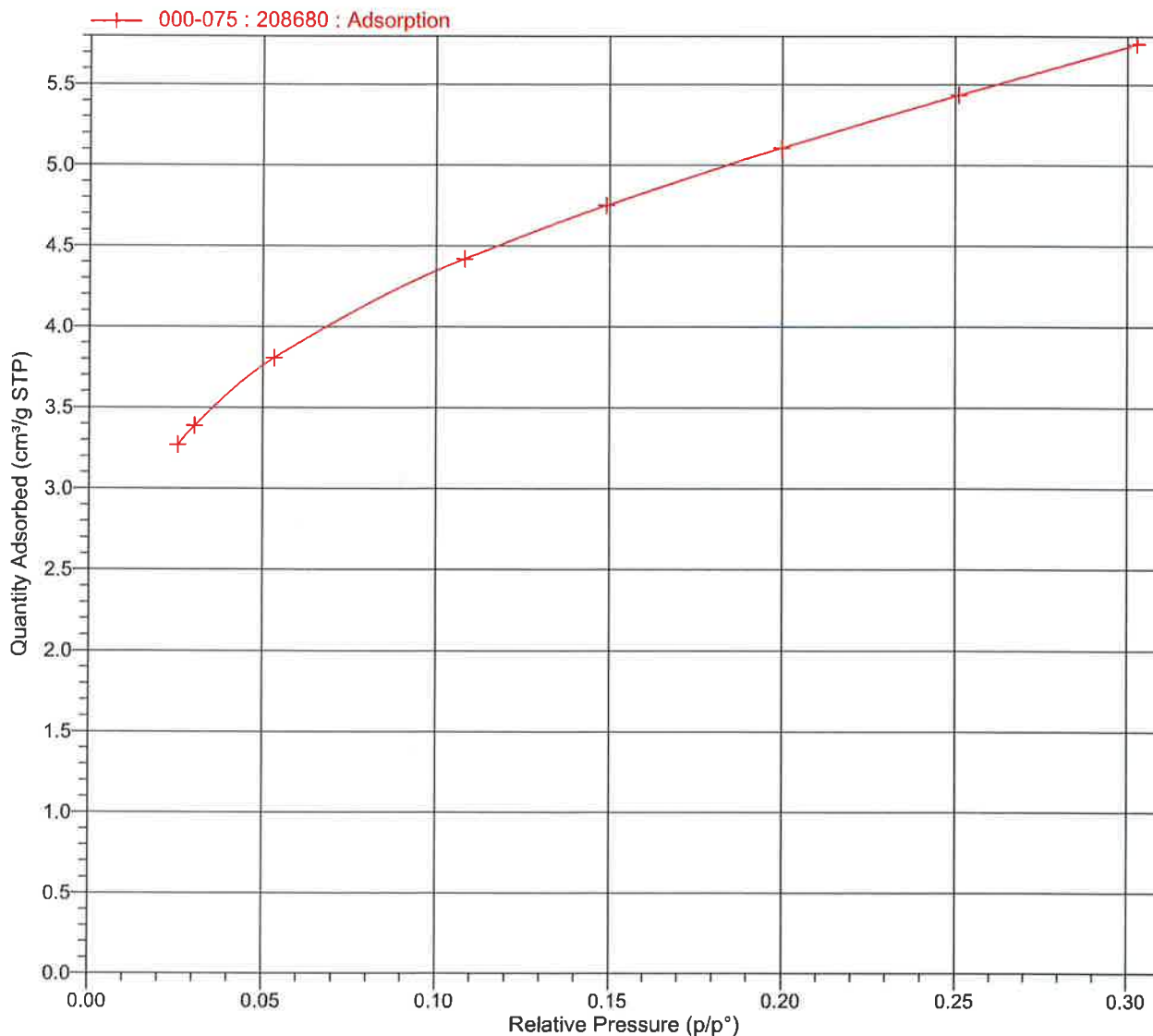
Page 3 of 8

Sample: 208680  
Operator: KW  
Submitter: Boral  
File: \\192.168.0.110\Public\PSS\Customers\L1...\000-075.SMP

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Low pressure dose: None  
Automatic degas: No

Analysis adsorptive: N<sub>2</sub>  
Analysis bath temp.: 77.323 K  
Thermal correction: No  
Warm free space: 12.0041 cm<sup>3</sup> Measured  
Equilibration interval: 15 s  
Sample density: 1.000 g/cm<sup>3</sup>

Isotherm Linear Plot



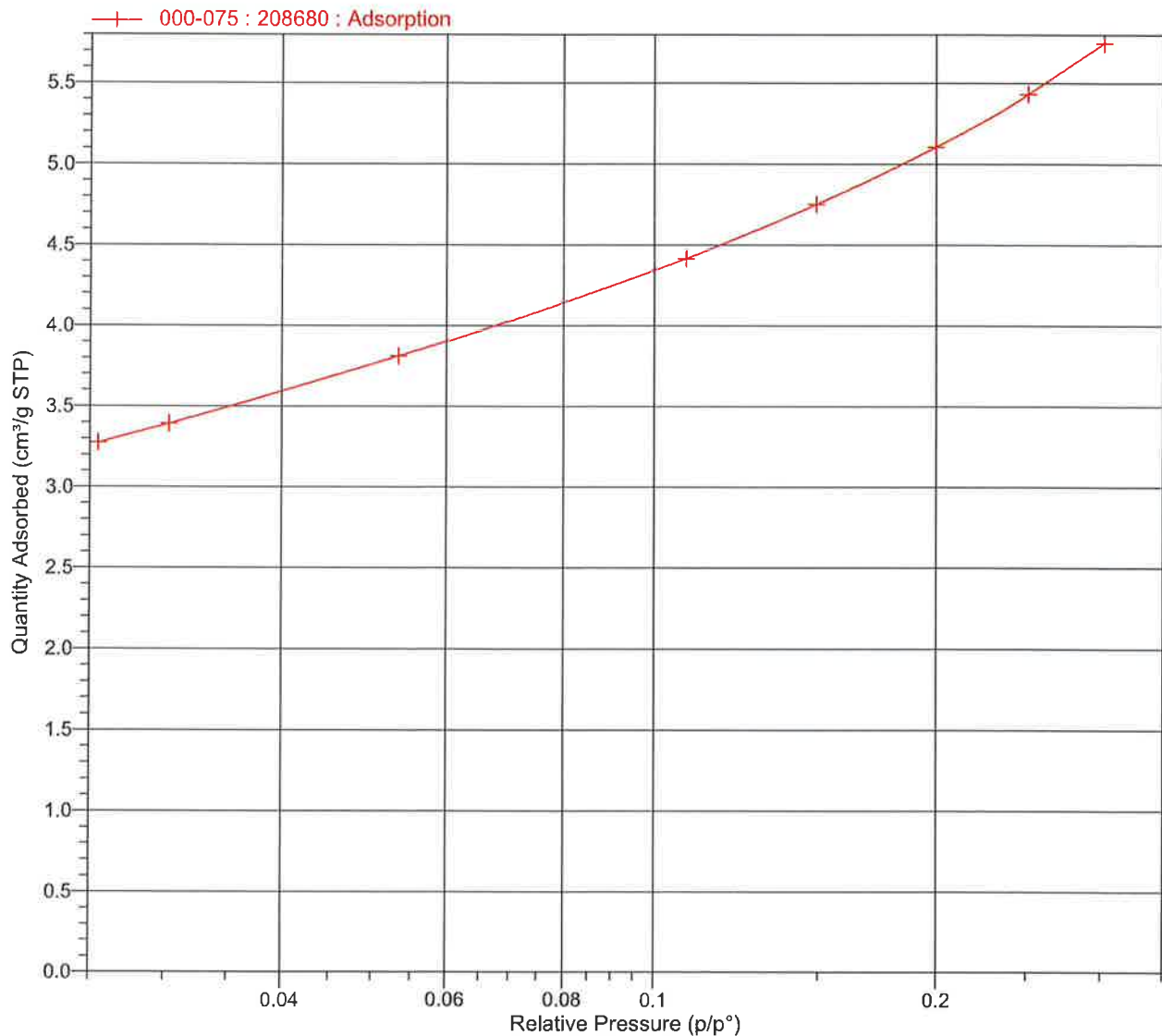


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Thermal correction: No  
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Equilibration interval: 15 s  
Sample density: 1.000 g/cm<sup>3</sup>

Isotherm Log Plot





Sample: 208680  
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Cold free space: 31.3704 cm <sup>3</sup>	Equilibration interval: 15 s
Low pressure dose: None	Sample density: 1.000 g/cm <sup>3</sup>
Automatic degas: No	

**BET Report**

BET surface area: 17.9714 ± 0.1766 m<sup>2</sup>/g  
Slope: 0.240573 ± 0.002346 g/cm<sup>3</sup> STP  
Y-intercept: 0.001621 ± 0.000400 g/cm<sup>3</sup> STP  
C: 149.379330  
Qm: 4.1289 cm<sup>3</sup>/g STP  
Correlation coefficient: 0.9997149  
Molecular cross-sectional area: 0.1620 nm<sup>2</sup>

Relative Pressure (p/p°)	Quantity Adsorbed (cm <sup>3</sup> /g STP)	1/[Q(p°/p - 1)]
0.025503420	3.2744	0.007993
0.030359131	3.3934	0.009227
0.053386577	3.8103	0.014801
0.108260491	4.4206	0.027463
0.149240943	4.7531	0.036906
0.199985318	5.1069	0.048949
0.251167129	5.4343	0.061721
0.302698914	5.7499	0.075497

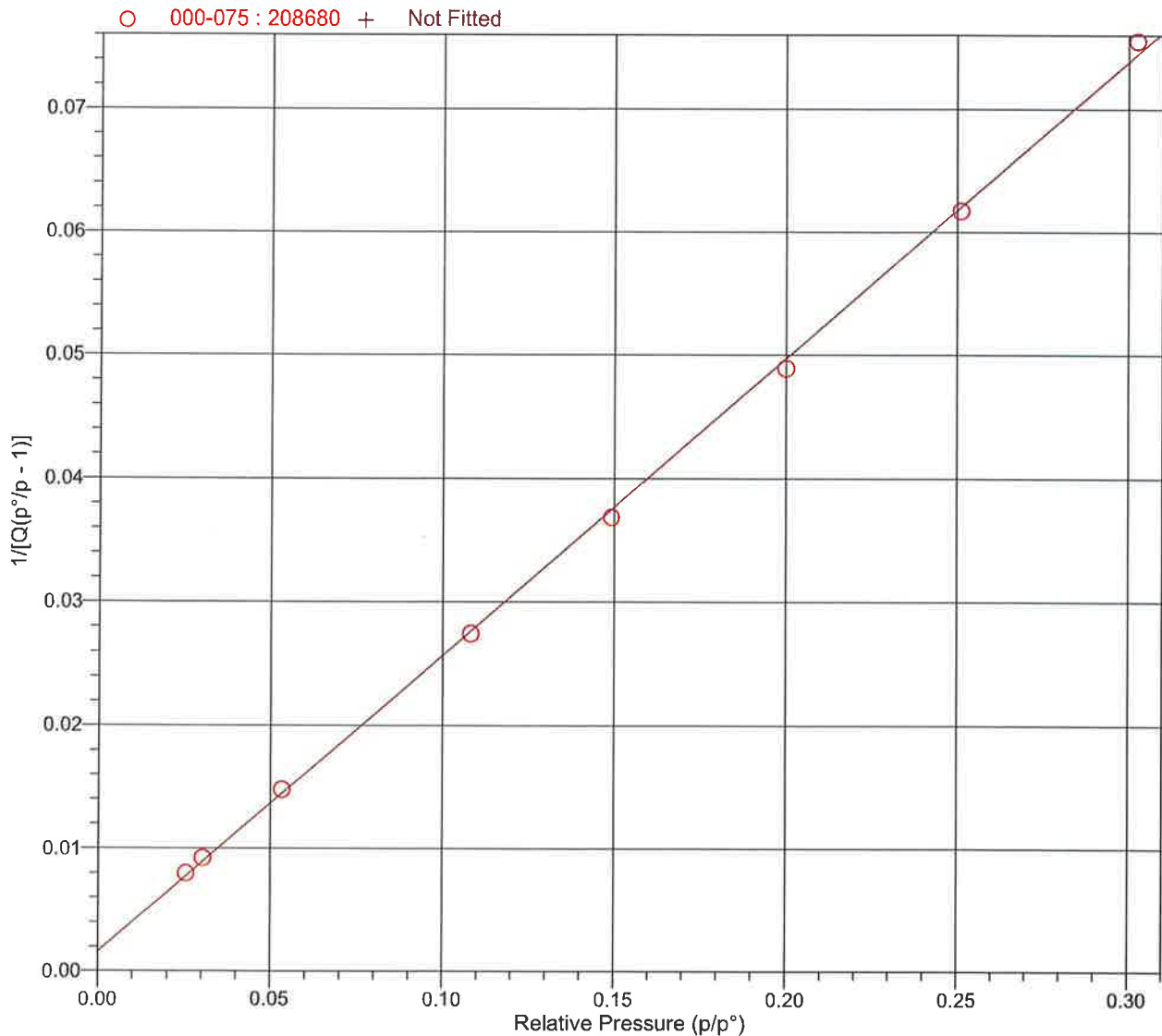


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Low pressure dose: None  
Automatic degas: No

Analysis adsorptive: N2  
Analysis bath temp.: 77.323 K  
Thermal correction: No  
Warm free space: 12.0041 cm<sup>3</sup> Measured  
Equilibration interval: 15 s  
Sample density: 1.000 g/cm<sup>3</sup>

BET Surface Area Plot





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Cold free space: 31.3704 cm <sup>3</sup>	Equilibration interval: 15 s
Low pressure dose: None	Sample density: 1.000 g/cm <sup>3</sup>
Automatic degas: No	

### Langmuir Report

Langmuir surface area: 25.3143 ± 0.8448 m<sup>2</sup>/g  
 Slope: 0.171941 ± 0.005738 g/cm<sup>3</sup> STP  
 Y-intercept: 3.396 ± 0.618 mmHg·g/cm<sup>3</sup> STP  
 b: 0.050636 1/mmHg  
 Qm: 5.8159 cm<sup>3</sup>/g STP  
 Correlation coefficient: 0.997228  
 Molecular cross-sectional area: 0.1620 nm<sup>2</sup>

Pressure (mmHg)	Quantity Adsorbed (cm <sup>3</sup> /g STP)	p/Q (mmHg·g/cm <sup>3</sup> STP)
19.316710	3.2744	5.899
22.994505	3.3934	6.776
40.435871	3.8103	10.612
81.998276	4.4206	18.549
113.037544	4.7531	23.782
151.472168	5.1069	29.660
190.238113	5.4343	35.007



Sample: 208680  
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Low pressure dose: None  
Automatic degas: No

Analysis adsorptive: N<sub>2</sub>  
Analysis bath temp.: 77.323 K  
Thermal correction: No  
Warm free space: 12.0041 cm<sup>3</sup> Measured  
Equilibration interval: 15 s  
Sample density: 1.000 g/cm<sup>3</sup>

Langmuir Surface Area Plot

