



**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:** 214368

**REQUEST No:** 81801

**SAMPLE IDENTIFICATION:** Ecotec Silica Fume – Monthly Sample for End of November 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	19/12/2018	2.20	AS 3583.5
Relative water requirement	20/12/2018	111%	AS 3583.6
Relative strength 7days (accelerated)	27/12/2018	113%	AS 3583.6
Relative strength 28days (standard)	17/01/2019	108%	AS 3583.6

Shaun Guthridge, Mat. File, File



Approved Signatory

*Julius Alvaro* Julius Alvaro

Date 24/01/19

Serial No. 176783

ACCREDITED FOR  
TECHNICAL  
COMPETENCE

Accredited for compliance with ISO/IEC 17025

NATA Accredited Laboratory

Number: 547



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

**REQUEST NO:** 81801

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**SOURCE OF SAMPLE:** Unknown

**SAMPLE IDENTIFICATION:** Ecotec Silica Fume – Monthly Sample for End of November 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:** 17/01/2019

**Date Crushed:** 24/01/2019 @ 7 Days

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

118% @ 7 Days  
29.0 MPa  
34.2 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 24/01/19

Serial No. 176784

Accredited for compliance with ISO/IEC 17025

NATA Accredited Laboratory

Number: 547



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**TEST REPORT**

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

**FILE NO:** 256/18

**REQUEST NO:** 81801

**LAB. SAMPLE NO:** 214368

**SOURCE OF SAMPLE:** Unknown

**SAMPLE IDENTIFICATION:** Ecotec Silica Fume – Monthly Sample for End of November 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	16/01/2019	0.8%	AS 3583.2	Max. 3.0%
Loss on ignition	19/01/2019	2.0%	AS 3583.3	Max. 6.0%
Relative Density	19/12/2018	2.20	AS 3583.5	

Sample submitted by the client.

Shaun Guthridge, Mat. File, File



Approved Signatory Julius C. Alvaro Julius Alvaro  
Date 24/01/19 Serial No. 176785

Accredited for compliance with ISO/IEC 17025

NATA Accredited Laboratory

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**TEST REPORT**

**CLIENT:** XYPEX AUSTRALIA

**FILE NO:** 256/18

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

**REQUEST NO:** 81801

**LAB. SAMPLE NO:** 214368

**SOURCE OF SAMPLE:** Unknown

**SAMPLE IDENTIFICATION:** Ecotec Silica Fume – Monthly Sample for End of November 2018

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

**Result:** 636 Kg/m<sup>3</sup>

Shaun Guthridge, Mat. File, File

  
Julius Alvaro  
24/01/2019



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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 End of November .2018.

REQUEST No.: 81801

**TEST PROCEDURE:**

AS 3583.12 – 1991 – Determination of Available Alkali

Laboratory Sample No.: 214368  
Date Sampled: November '2018  
Date Received: 03/12/18  
Sample Description: Ecotec Silca Fume –  
Monthly Sample for End of  
November' 2018.  
Field No.: 1

**TEST RESULTS:**

Sodium as Na <sub>2</sub> O (%)	0.09
Potassium as K <sub>2</sub> O (%)	0.06
Available Alkali (%)	0.1

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  Nanthini Selvadurai

Date 04-01-19 Serial No. 176786



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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 End of November' 2018

REQUEST No.:81801

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

Laboratory Sample No.: 214368  
Date Sampled: November'2018  
Date Received: 03/12/18  
Sample Description: Ecotec Silca Fume  
monthly sample for End  
of November' 2018.  
Field No.: 1


**TEST RESULTS:**

Chloride as Cl<sup>-</sup> (%) 0.002  
Sulphate as SO<sub>3</sub> (%) 0.3

Samples submitted by the Client.

S.Guthridge, Mat. File, File.



Approved Signatory  Nanthini Selvadurai  
Date 04-01-19 Serial No. 176787



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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 End of November' 2018.

REQUEST No.: 81801

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

Laboratory Sample No.: 214368  
Date Sampled: November' 2018.  
Date Received: 03/12/18  
Sample Description: Ecotec Silica Fume  
End of November'  
2018.  
Field No.: 1

**TEST RESULTS**

Silicon as SiO<sub>2</sub> (%) 94.7

Sample submitted by the Client.

Nanthini S  
Analytical Chemist  
04<sup>th</sup> January 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

## Particle and Surface Sciences Surface Area Analysis

MicroActive 4.06

3000  
Serial # 1586 Unit 1 Port 2

Page 1 of 11

Sample: 214368  
Operator: PS  
Submitter: Boral  
File: \\psscloud\public\PsS\Customers\L192 - ...1000-103.SMP

Started:	21/12/2018 3:13:31 AM	Analysis adsorptive:	N2
Completed:	21/12/2018 5:46:25 AM	Analysis bath temp.:	77.404 K
Report time:	21/12/2018 4:37:40 PM	Thermal correction:	No
Sample mass:	0.4677 g	Warm free space:	17.5075 cm <sup>3</sup> Measured
Cold free space:	49.5902 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  $p/p^{\circ} = 0.249789049$ : 17.9930 m<sup>2</sup>/g

BET Surface Area: 18.5695 m<sup>2</sup>/g

Langmuir Surface Area: 27.1142 m<sup>2</sup>/g





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Page 2 of 11

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Automatic degas:	No		

### Isotherm Tabular Report

Relative Pressure (p/p°)	Absolute Pressure (kPa)	Quantity Adsorbed (mmol/g)	Elapsed Time (h:min)	Saturation Pressure (kPa)
			01:58	101.9429421
0.027688581	2.8226554	0.14976	02:04	
0.033454571	3.4104574	0.15581	02:08	
0.054641622	5.5703277	0.17276	02:11	
0.097413080	9.9305760	0.19549	02:15	
0.149391520	15.2294111	0.21552	02:18	
0.199577603	20.3455280	0.23146	02:21	
0.249789049	25.4642305	0.24584	02:24	
0.300076586	30.5906900	0.25950	02:28	



## Particle and Surface Sciences Surface Area Analysis

MicroActive 4.06

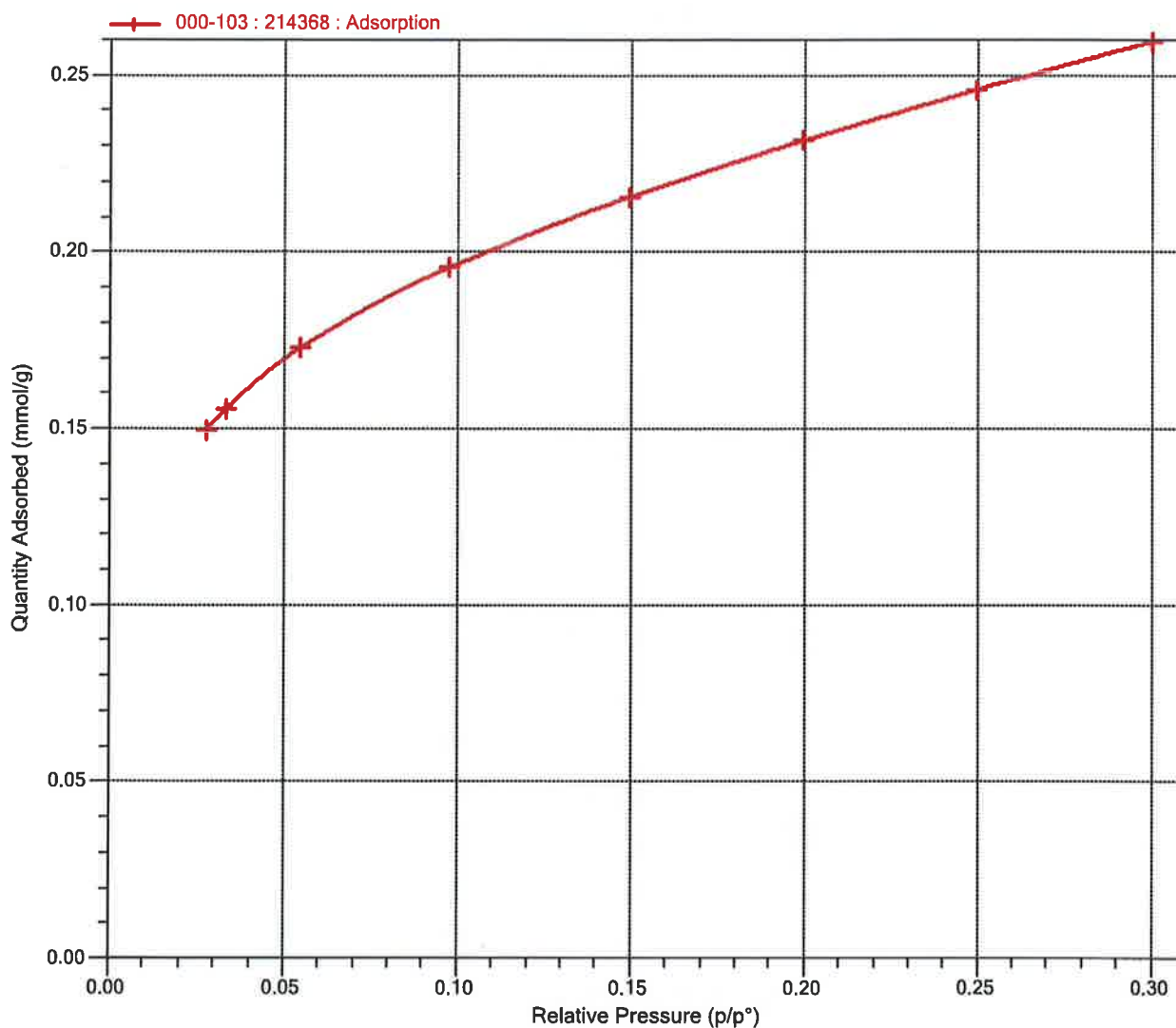
3000  
Serial # 1586 Unit 1 Port 2

Page 3 of 11

Sample: 214368  
Operator: PS  
Submitter: Boral  
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Low pressure dose:	None	Sample density:	1.000 g/cm <sup>3</sup>
Automatic degas:	No		

Isotherm Linear Plot





## Particle and Surface Sciences Surface Area Analysis

MicroActive 4.06

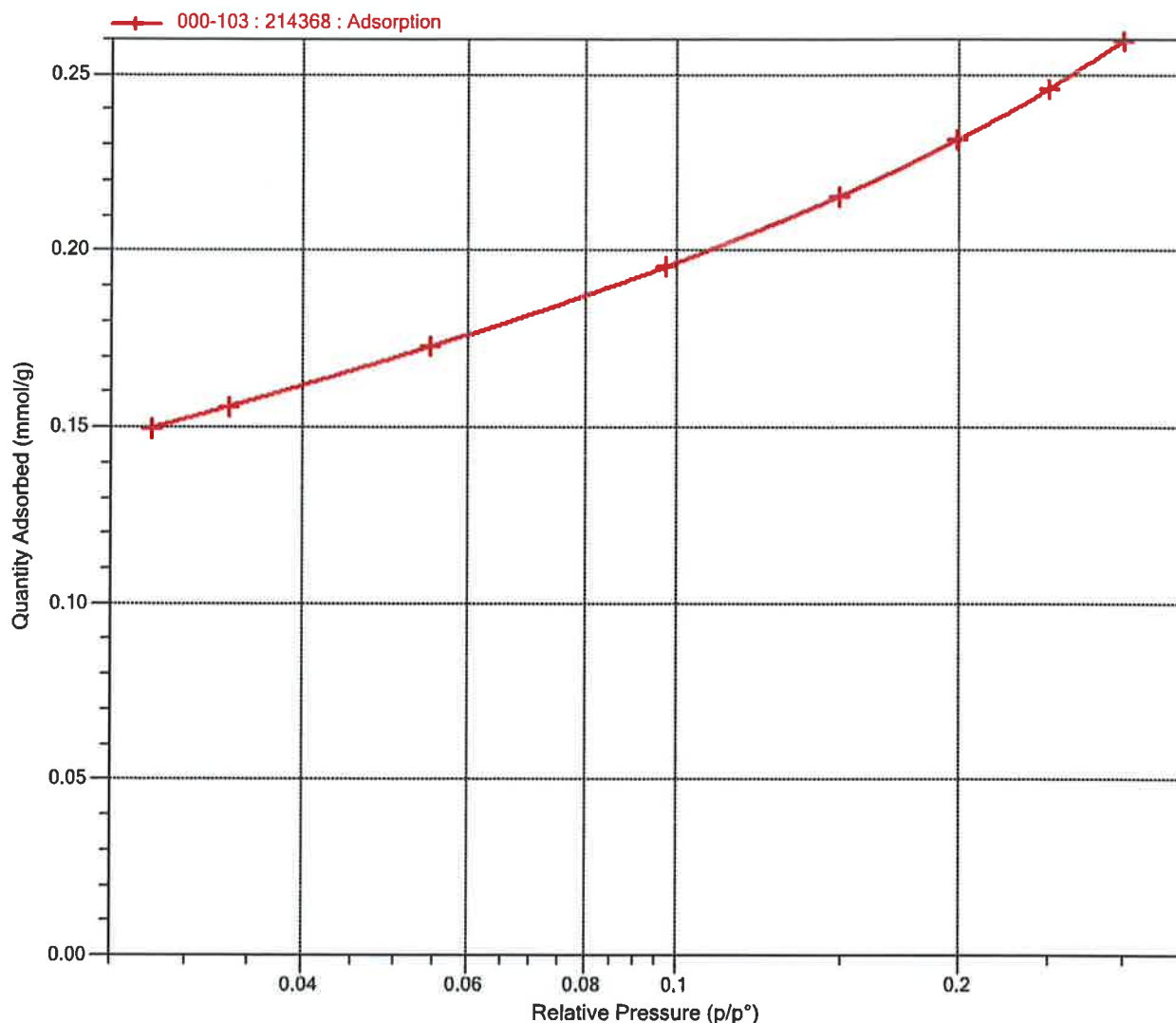
3000  
Serial # 1586 Unit 1 Port 2

Page 4 of 11

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Low pressure dose:	None	Sample density:	1.000 g/cm <sup>3</sup>
Automatic degas:	No		

Isotherm Log Plot





## Particle and Surface Sciences Surface Area Analysis

MicroActive 4.06

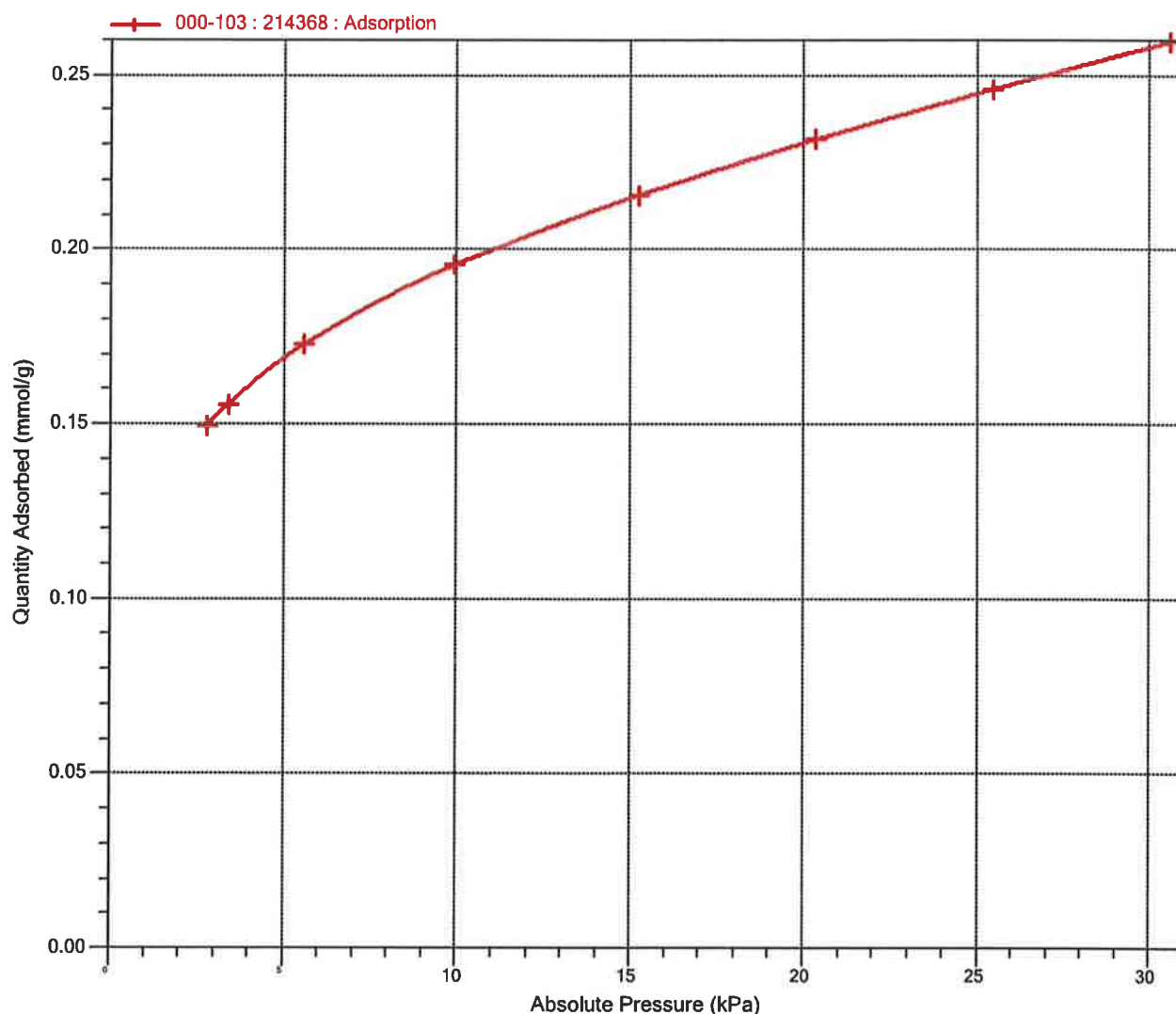
3000  
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Automatic degas:	No		

Isotherm Linear Absolute Plot





## Particle and Surface Sciences Surface Area Analysis

MicroActive 4.06

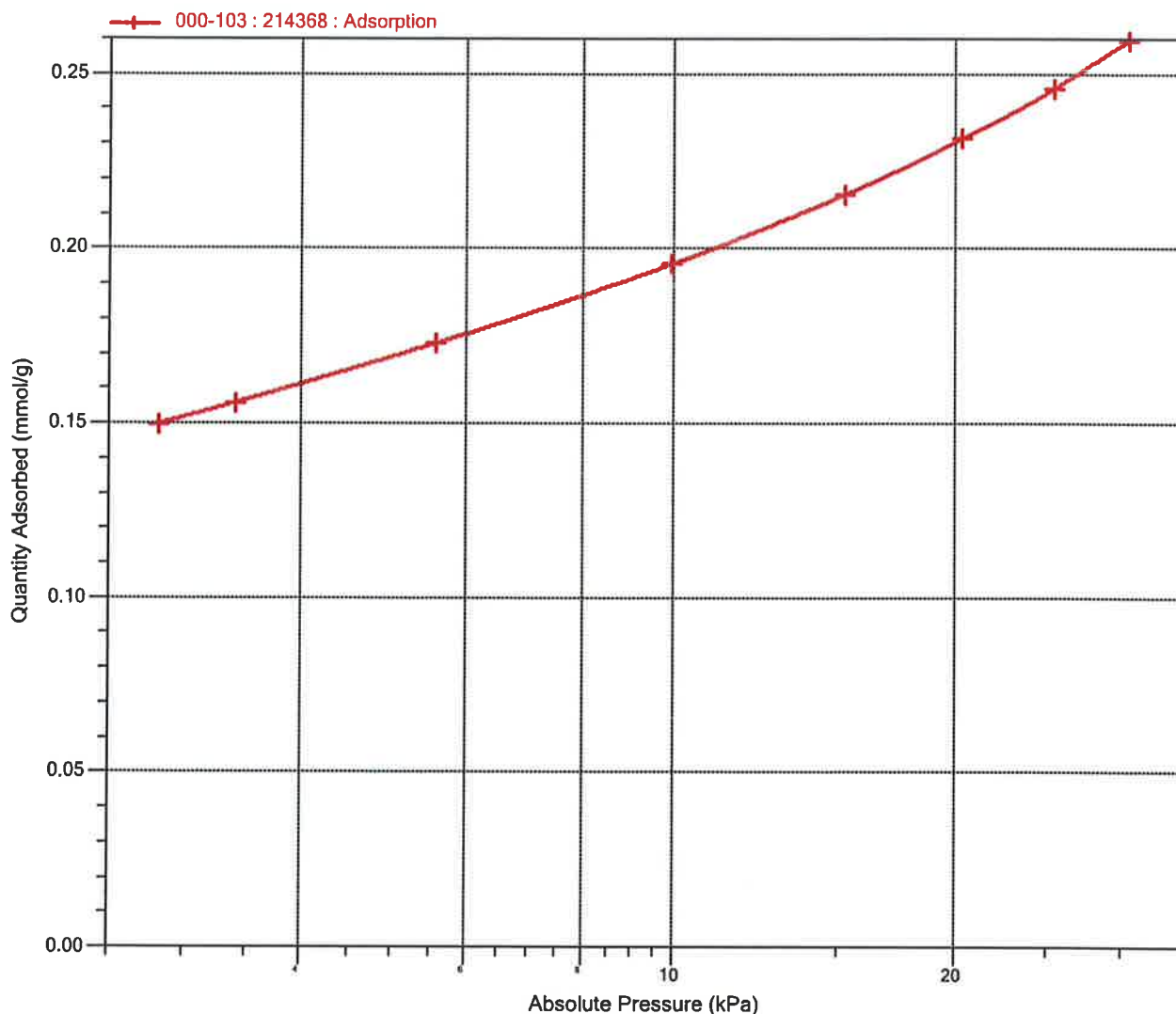
3000  
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Page 6 of 11

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Low pressure dose:	None	Sample density:	1.000 g/cm <sup>3</sup>
Automatic degas:	No		

Isotherm Log Absolute Plot





## Particle and Surface Sciences Surface Area Analysis

MicroActive 4.06

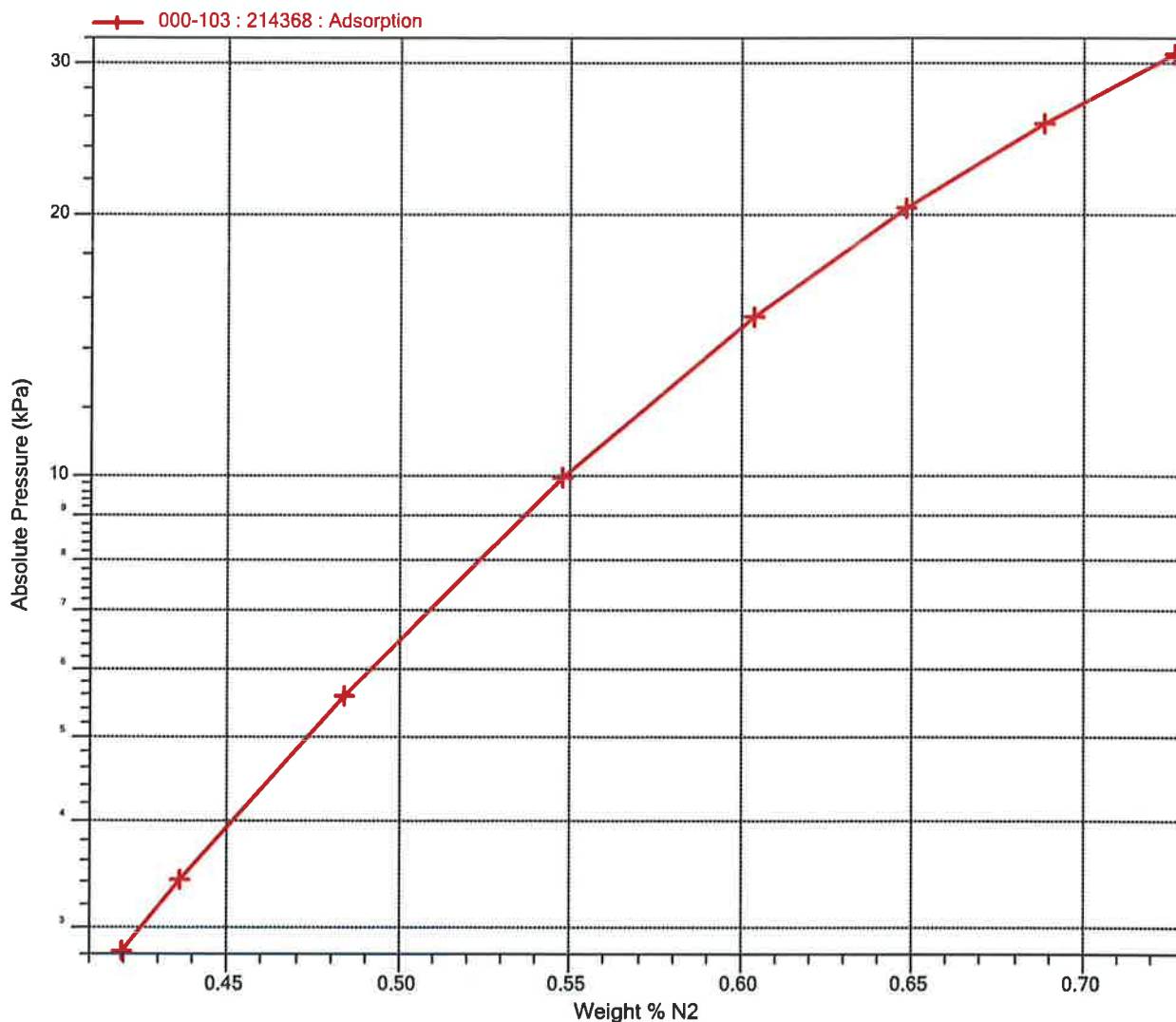
3000  
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Automatic degas:	No		

### Isotherm Pressure Composition





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MicroActive 4.06

3000  
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Cold free space:	49.5902 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: 18.5695 ± 0.1938 m<sup>2</sup>/g  
Slope: 5.209348 ± 0.054094 g/mmol  
Y-intercept: 0.044382 ± 0.008955 g/mmol  
c: 118.375393  
Qm: 0.19034 mmol/g  
Correlation coefficient: 0.9998383  
Molecular cross-sectional area: 0.1620 nm<sup>2</sup>

Relative Pressure (p/p <sup>o</sup> )	Quantity Adsorbed (mmol/g)	1/[Q(p <sup>o</sup> /p - 1)]
0.054641622	0.17276	0.33456
0.097413080	0.19549	0.55208
0.149391520	0.21552	0.81491
0.199577603	0.23146	1.07724
0.249789049	0.24584	1.35437



## Particle and Surface Sciences Surface Area Analysis

MicroActive 4.06

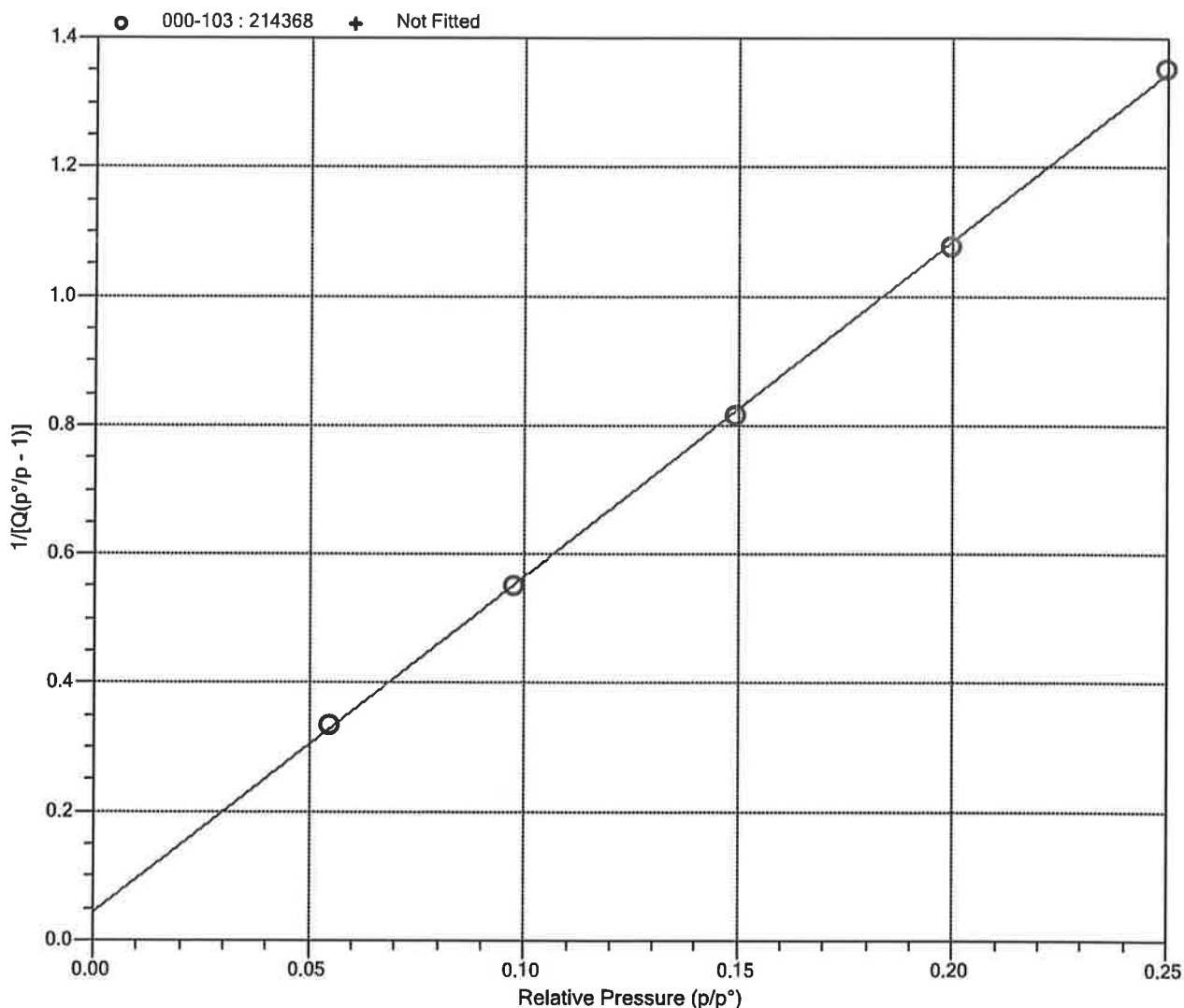
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Automatic degas:	No		

### BET Surface Area Plot







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Cold free space:	49.5902 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: 27.1142 ± 0.8975 m<sup>2</sup>/g  
Slope: 3.59809 ± 0.11910 g/mmol  
Y-intercept: 11.989 ± 2.054 g/mmol·kPa  
<sup>b</sup>: 0.30011 1/kPa  
Qm: 0.27793 mmol/g  
Correlation coefficient: 0.996729  
Molecular cross-sectional area: 0.1620 nm<sup>2</sup>

Pressure (kPa)	Quantity Adsorbed (mmol/g)	p/Q (g/mmol·kPa)
2.8226554	0.14976	18.848
3.4104574	0.15581	21.889
5.5703277	0.17276	32.243
9.9305760	0.19549	50.798
15.2294111	0.21552	70.663
20.3455280	0.23146	87.900
25.4642305	0.24584	103.581
30.5906900	0.25950	117.884



## Particle and Surface Sciences Surface Area Analysis

MicroActive 4.06

3000  
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Page 11 of 11

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Cold free space:	49.5902 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 Surface Area Plot

