



**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

SUMMARY OF TEST RESULTS
XYPEX ADMIXTURE BIO-SAN C500

Vs

REQUIREMENTS OF AS1478.1-2000, TYPE SN ADMIXTURE
(Average of Two Tests using Type GP Cement)

Tests were conducted to investigate the performance of a sample of Xypex Admix Bio-San C500 at dosage rate of 1.0% (by weight of total cementitious content) against the requirements of AS1478.1-2000, Chemical Admixture for Concrete, Type SN, Special Purpose Normal-Setting Admixture.

Client Number: 256/18

Date Mixed: 15.06.2018

Cement: Boral Cement – Type-GP (SL)

Request No: 78804

Requirements and Test Results were:

	<u>AS1478.1 REQUIREMENTS</u>	<u>CONTROL MIX</u>	<u>MIX CONTAINING XYPEX ADMIX BIO-SAN C500</u>
Cement Content (Kg/m ³)	300 ± 15	304	304
Slump (mm)	80 ± 10	85	80
Time of Setting			
Initial Setting	±1 hour	3h:33m	4h: 5m (+0:30m)
Final Setting	±1 hour	5h:48m	6h:18m (+0:30m)
Water Content (L)	Report	196	194
Drying Shrinkage (56 days)	Test and Report	560 µ-strain	550 µ-strain (98%)
Compressive Strength (MPa)			
<u>Age at Test</u>	<u>Minimum % of Control</u>		
3 days	90%	23.5	25.5 (109%)
7 days	90%	29.5	33.0 (111%)
28 days	90%	38.0	40.0 (106%)
90 days	90%	44.0	46.5 (106%)

Date: 14.09.2018

Robert Camilleri
Concrete Section Head



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Boral Resources (NSW) Pty Ltd
 ACN: 000 756 507
 3-5 Gibbon Road, BAULKHAM HILLS, NSW 2153
 PO Box 400
 Winston Hills, NSW, 2153
 Phone Number: (02) 9624 9900
 Fax Number: (02) 9624 9999

Corporate Site #:xbh

Report No: WMT-18/06381

Issue No: 2

This report replaces all previous issues of report no 'WMT-18/06381'.

Concrete Test Report

Client: XYPEX AUSTRALIA
 190 Toongabbie Road
 Girraween NSW

Project: AS 1478 Compliance Tests for Admixture Xypex BIO-SAN C500



Accredited for compliance with ISO/IEC 17025 - Testing

NATA Accredited Laboratory
 Number: 547
 Approved Signatory: Robert Camilleri
 Date of Issue: 14/09/2018
THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL

COMPRESSIVE STRENGTH OF CONCRETE CYLINDERS

Details of Sampled Concrete Concrete Specimens and Results

Date & Time Batched	Time Sampled	Plant Code	Grade(MPa)	Alr(%)	Specimen Ident.	Dimensions (mm)	Density (kg/m ³)	Curing Initial	Type	Date of Test	Age (days)	Strength (MPa)	Marks Fail Mode	Location & Remarks	
Truck No	Time Moulded	Docket No	Agg(mm)	Compact		Avg. Diameter Height	(kg/m ³)	(hrs)	of Cap	Test	(days)	(MPa)			
Load / Prog. Load		Product Code	Slump/Super(mm)	Design Measured											
15/06/18	07:04	MTS	32	1.2	T9278A	100.4 195	2440	24	2	G	18/06/18	3	23.5	N	Sampling AS 1012.1 Cl 6b Concrete Temp. (°C): 21 MTS; Lab Sample No:205788
N/A		T9278	20	IV	T9278B	100.1 197	2440		2	G	18/06/18	3	23.0	N	
N/A		Control	80/N/A	85/N/A	T9278C	99.8 195	2480		6	G	22/06/18	7	28.5	N	
					T9278D	99.7 196	2460		6	G	22/06/18	7	30.5	N	
					T9278E	100.5 195	2460		27	G	13/07/18	28	37.0	N	
					T9278F	100.3 195	2440		27	G	13/07/18	28	38.5	N	
					T9278G	100.2 195	2440		27	G	13/07/18	28	36.5	N	
					T9278H	100.1 193	2440		89	G	13/09/18	90	43.0	N	
					T9278I	100.3 192	2460		89	G	13/09/18	90	43.5	N	

Notes

1. Sampling in accordance with AS 1012.1
2. Slump test in accordance with AS 1012.3.1
3. Air content in accordance with AS 1012.4.2
4. Compression specimen compaction by vibration, in accordance with AS 1012.8.1 Clause 7.4
5. Initial curing in accordance with AS 1012.8.1 Clause 9.2.2
6. Standard curing in accordance with AS 1012.8.1 Clause 9.3(a)
7. Capping R - Rubber, S - Sulphur, N - Nil, T - Timber, G - Ground
8. Compressive strength in accordance with AS 1012.9
9. Density in accordance with AS 1012.12.1
10. Moisture condition SSD in accordance with AS 1012.12.1, unless otherwise stated

Remarks

Failure Mode: N = Normal
 Compaction: IV = Internal Vibrator



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Corporate Site #:xbh

Concrete Shrinkage Test Report

Report No: SHR:WMT-18/06381-C01

Issue No: 2

This report replaces all previous issues of report no 'SHR:WMT-18/06381-C01'.

Client: XYPEX AUSTRALIA
 190 Toongabbie Road
 Girraween NSW

Project: AS 1478 Compliance Tests for Admixture Xypex BIO-SAN C500

Accredited for compliance with ISO/IEC 17025 - Testing



APPROVED FOR TECHNICAL COMPETENCE



NATA Accredited Laboratory
 Number: 547

Approved Signatory: Robert Camilleri
 Date of Issue: 14/09/2018

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CONCRETE SHRINKAGE TEST REPORT

We advise that the sampling and slump testing were carried out in accordance with AS1012.1 and AS1012.3.1. Samples moulded in the laboratory and specimens tested in accordance with AS1012.13 UNLESS otherwise stated in comments.

Plant	Field Sheet	Product	Docket	Sample Time	Initial Cure Hours	Actual Slump	Despatch Date/Time	Condition Received	Demould Date/Time	Received Date/Time
MTS	T9278	Control	T9278	07:04	24	85	N/A N/A	SSD	16/06/2018 07:15	16/06/2018 N/A

Location: MTS; Lab Sample No:205788

Site Min Temp (°C): N/A

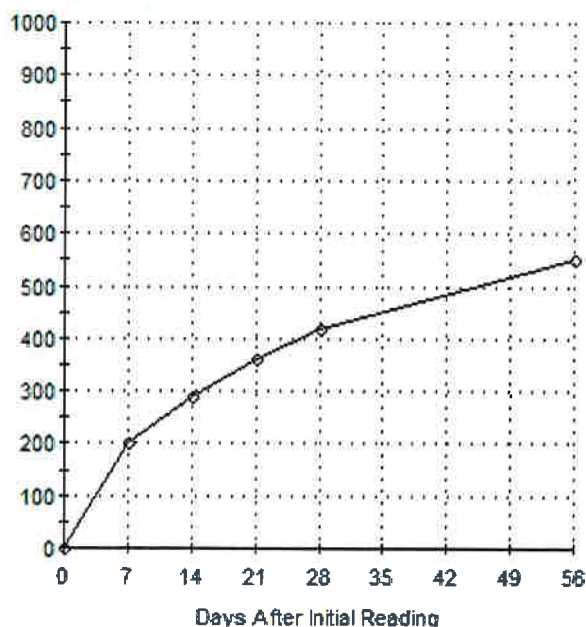
Site Max Temp (°C): N/A

Date of Moulding: 15/06/2018

Initial Reading: 22/06/2018

Drying Period (days)	Test Date	Drying Shrinkage (MicroStrain)			
		Specimen #1	Specimen #2	Specimen #3	Average
7	29/06/2018	208	208	192	200
14	6/07/2018	288	308	276	290
21	13/07/2018	368	376	348	360
28	20/07/2018	420	436	408	420
56	17/08/2018	544	564	532	550

Mean Drying Shrinkage (MicroStrain)



Comments

* - Readings outside of 40 median have been excluded from the average



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Corporate Site #.xbh

Concrete Test Report

Report No: WMT-18/06382

Issue No: 2

This report replaces all previous issues of report no 'WMT-18/06382'.

Client: XYPEX AUSTRALIA
 190 Toongabbie Road
 Girraween NSW

Project: AS 1478 Compliance Tests for Admixture Xypex BIO-SAN C500

Accredited for compliance with ISO/IEC 17025 - Testing



APPROVED FOR TECHNICAL COMPETENCE

Robert Camilleri

NATA Accredited Laboratory
 Number: 547 Date of Issue: 14/09/2018

Approved Signatory: Robert Camilleri

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COMPRESSIVE STRENGTH OF CONCRETE CYLINDERS

Details of Sampled Concrete Concrete Specimens and Results

Date & Time Batched	Time Sampled	Plant Code	Grade(MPa)	Air(%)	Specimen	Dimensions	Density	Curing	Type	Date of	Age	Strength	Mark	Fail	Location & Remarks	
Truck No	Time Moulded	Docket No	Agg(mm)	Compact	Ident.	(mm)	(kg/m ³)	Initial	of	Test	(days)	(MPa)		Mode		
Load / Prog. Load	Product Code	Slump/Super(mm)	Design	Measured		Avg. Diameter	Height	(hrs)	Cap							
15/06/18	07:38	MTS	32	1.2	T9279A	100.4	197	2420	24	2	G	18/06/18	3	23.0	N	Sampling AS 1012.1 Cl 6b
N/A		T9279	20	IV	T9279B	99.9	195	2420	2	2	G	18/06/18	3	23.5	N	Concrete Temp. (°C): 22
N/A		Control Duplicate	80/N/A	80/N/A	T9279C	99.7	197	2460	6	6	G	22/06/18	7	29.0	N	MTS; Lab Sample No:205789
					T9279D	100.0	196	2460	6	6	G	22/06/18	7	30.0	N	
					T9279E	99.9	195	2460	27	27	G	13/07/18	28	37.0	N	
					T9279F	100.0	195	2460	27	27	G	13/07/18	28	38.0	N	
					T9279G	100.1	194	2460	27	27	G	13/07/18	28	40.0	N	
					T9279H	100.0	194	2460	89	89	G	13/09/18	90	44.5	N	
					T9279I	100.0	193	2460	89	89	G	13/09/18	90	44.5	N	

Notes

1. Sampling in accordance with AS 1012.1
2. Slump test in accordance with AS 1012.3.1
3. Air content in accordance with AS 1012.4.2
4. Compression specimen compaction by vibration, in accordance with AS 1012.8.1 Clause 7.4
5. Initial curing in accordance with AS 1012.8.1 Clause 9.2.2
6. Standard curing in accordance with AS 1012.8.1 Clause 9.3(a)
7. Capping R - Rubber, S - Sulphur, N - Nil, T - Timber, G - Ground
8. Compressive strength in accordance with AS 1012.9
9. Density in accordance with AS 1012.12.1
10. Moisture condition SSD in accordance with AS 1012.12.1, unless otherwise stated

Remarks

Failure Mode: N = Normal
 Compaction: IV = Internal Vibrator



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 Winston Hills, NSW, 2153
 Phone Number: (02) 9624 9900
 Fax Number: (02) 9624 9999

Corporate Site #:xbh

Report No: SHR:WMT-18/06382-C01

Issue No: 2

This report replaces all previous issues of report no 'SHR:WMT-18/06382-C01'

Concrete Shrinkage Test Report

Client: XYPEX AUSTRALIA
 190 Toongabbie Road
 Girraween NSW

Project: AS 1478 Compliance Tests for Admixture Xypex BIO-SAN C500

Accredited for compliance with ISO/IEC 17025 - Testing



APPROVED FOR TECHNICAL COMPETENCE

Robert Camilleri

NATA Accredited Laboratory
 Number: 547

Approved Signatory: Robert Camilleri
 Date of Issue: 14/09/2018

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CONCRETE SHRINKAGE TEST REPORT

We advise that the sampling and slump testing were carried out in accordance with AS1012.1 and AS1012.3.1. Samples moulded in the laboratory and specimens tested in accordance with AS1012.13 UNLESS otherwise stated in comments.

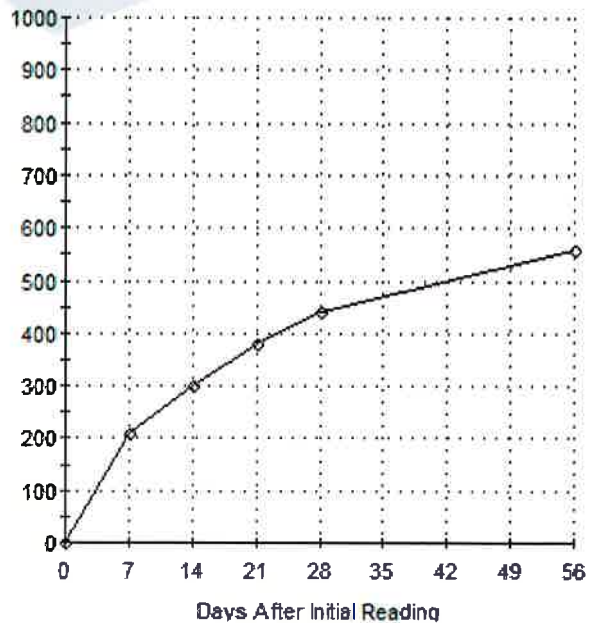
Plant	Field Sheet	Product	Docket	Sample Time	Initial Cure Hours	Actual Slump	Despatch Date/Time	Condition Received	Demould Date/Time	Received Date/Time
MTS	T9279	Control Duplicate	T9279	07:38	24	80	N/A N/A	SSD	16/06/2018 07:38	16/06/2018 N/A

Location: MTS; Lab Sample No:205789

Site Min Temp (°C): N/A
 Site Max Temp (°C): N/A
 Date of Moulding: 15/06/2018
 Initial Reading: 22/06/2018

Drying Period (days)	Test Date	Drying Shrinkage (MicroStrain)			
		Specimen #1	Specimen #2	Specimen #3	Average
7	29/06/2018	224	208	204	210
14	6/07/2018	316	300	296	300
21	13/07/2018	392	372	364	380
28	20/07/2018	452	432	432	440
56	17/08/2018	580	560	552	560

Mean Drying Shrinkage (MicroStrain)



Comments

* - Readings outside of 40 median have been excluded from the average



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 3-5 Gibbon Road, BAULKHAM HILLS, NSW 2153
 PO Box 400
 Winston Hills, NSW, 2153
 Phone Number: (02) 9624 9900
 Fax Number: (02) 9624 9999

Corporate Site #:xbh

Concrete Test Report

Report No: WMT-18/06383

Issue No: 2

This report replaces all previous issues of report no 'WMT-18/06383'.

Client: XYPEX AUSTRALIA
 190 Toongabbie Road
 Girraween NSW

Project: AS 1478 Compliance Tests for Admixture Xypex BIO-SAN C500



Accredited for compliance with ISO/IEC 17025 - Testing

NATA Accredited Laboratory
 Number: 547
 Approved Signatory: Robert Camilleri
 Date of Issue: 14/09/2018
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COMPRESSIVE STRENGTH OF CONCRETE CYLINDERS

Details of Sampled Concrete

Concrete Specimens and Results

Date & Time Batched	Time Sampled	Plant Code	Grade(MPa)	Air(%)	Specimen Ident.	Dimensions (mm)	Density (kg/m ³)	Curing Initial	Type of Cap	Date of Test	Age (days)	Strength (MPa)	Failure Mode	Location & Remarks
Truck No	Time Moulded	Docket No	Slump/Super(mm)	Compact		Avg. Diameter		(hrs)						
Load / Prog. Load		Product Code	Design	Measured										
15/06/18	08:01	MTS	32	1.2	T9280A	100.0 194	2420	24	2	G	18/06/18	3	25.5	N Sampling AS 1012.1 Cl 6b
N/A		T9280	20	IV	T9280B	100.2 196	2420	2	2	G	18/06/18	3	25.0	N Concrete Temp. (°C): 22
N/A		Bio-San C500	80/N/A	80/N/A	T9280C	100.3 196	2460	6	6	G	22/06/18	7	34.0	N MTS; Lab Sample No:205790
					T9280D	100.0 197	2460	6	6	G	22/06/18	7	33.0	N
					T9280E	100.1 195	2460	27	6	G	13/07/18	28	36.5	N
					T9280F	100.1 195	2460	27	6	G	13/07/18	28	39.5	N
					T9280G	100.4 195	2440	27	6	G	13/07/18	28	39.5	N
					T9280H	100.1 194	2460	89	6	G	13/09/18	90	45.0	N
					T9280I	100.0 193	2440	89	6	G	13/09/18	90	46.0	N

Notes

1. Sampling in accordance with AS 1012.1
2. Slump test in accordance with AS 1012.3.1
3. Air content in accordance with AS 1012.4.2
4. Compression specimen compaction by vibration, in accordance with AS 1012.8.1 Clause 7.4
5. Initial curing in accordance with AS 1012.8.1 Clause 9.2.2
6. Standard curing in accordance with AS 1012.8.1 Clause 9.3(a)
7. Capping R - Rubber, S - Sulphur, N - Nil, T - Timber, G - Ground
8. Compressive strength in accordance with AS 1012.9
9. Density in accordance with AS 1012.12.1
10. Moisture condition SSD in accordance with AS 1012.12.1, unless otherwise stated

Remarks

FailureMode: N = Normal
 Compaction: IV = Internal Vibrator



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Boral Resources (NSW) Pty Ltd
 ACN: 000 756 507
 3-5 Gibbon Road, BAULKHAM HILLS, NSW 2153
 PO Box 400
 Winston Hills, NSW, 2153
 Phone Number: (02) 9624 9900
 Fax Number: (02) 9624 9999

Corporate Site #: xbh

Concrete Shrinkage Test Report

Report No: SHR:WMT-18/06383-C01

Issue No: 2

This report replaces all previous issues of report no 'SHR:WMT-18/06383-C01'.

Client: XYPEX AUSTRALIA
 190 Toongabbie Road
 Girraween NSW

Project: AS 1478 Compliance Tests for Admixture Xypex BIO-SAN C500

Accredited for compliance with ISO/IEC 17025 - Testing



APPROVED FOR TECHNICAL COMPETENCE

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NATA Accredited Laboratory
 Number: 547

Approved Signatory: Robert Camilleri
 Date of Issue: 14/09/2018

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CONCRETE SHRINKAGE TEST REPORT

We advise that the sampling and slump testing were carried out in accordance with AS1012.1 and AS1012.3.1. Samples moulded in the laboratory and specimens tested in accordance with AS1012.13 UNLESS otherwise stated in comments.

Plant	Field Sheet	Product	Docket	Sample Time	Initial Cure Hours	Actual Slump	Despatch Date/Time	Condition Received	Demould Date/Time	Received Date/Time
MTS	T9280	Bio-San C500	T9280	08:01	24	80	N/A N/A	SSD	16/06/2018 08:01	16/06/2018 N/A

Location: MTS; Lab Sample No:205790

Site Min Temp (°C): N/A

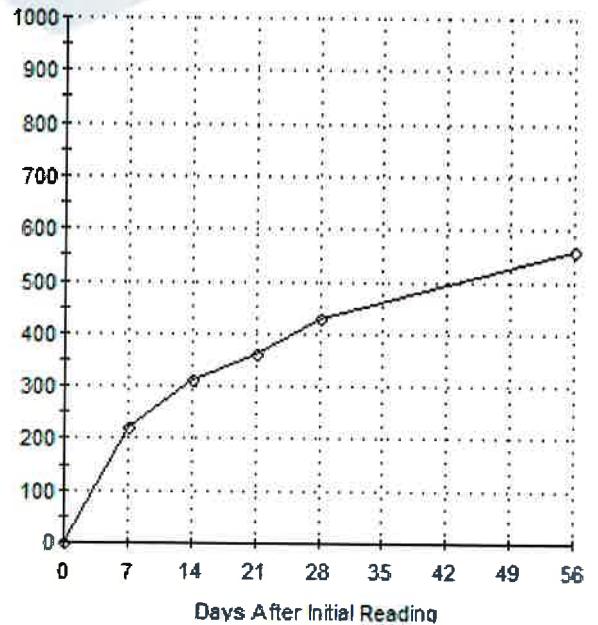
Site Max Temp (°C): N/A

Date of Moulding: 15/06/2018

Initial Reading: 22/06/2018

Drying Period (days)	Test Date	Drying Shrinkage (MicroStrain)			
		Specimen #1	Specimen #2	Specimen #3	Average
7	29/06/2018	200	228	220	220
14	6/07/2018	284	328	304	310
21	13/07/2018	352	392	348	360
28	20/07/2018	412	456	424	430
56	17/08/2018	540	576	552	560

Mean Drying Shrinkage (MicroStrain)



Comments

* - Readings outside of 40 median have been excluded from the average



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 Fax Number: (02) 9624 9999

Corporate Site #.xbh

Concrete Test Report

Report No: WMT-18/06384

Issue No: 2

This report replaces all previous issues of report no 'WMT-18/06384'.

Client: XYPEX AUSTRALIA
 190 Toongabbie Road
 Girraween NSW

Project: AS 1478 Compliance Tests for Admixture Xypex BIO-SAN C500



ACCREDITED FOR
**TECHNICAL
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COMPRESSIVE STRENGTH OF CONCRETE CYLINDERS

Details of Sampled Concrete

Concrete Specimens and Results

Date & Time Batched	Time Sampled	Plant Code	Grade(MPa)	Air(%)	Specimen	Dimensions	Density	Curing	Type	Date of	Age	Strength	Mark	Fall	Location & Remarks
Truck No	Time Moulded	Docket No	Agg(mm)	Compact	Ident.	(mm)	(kg/m³)	Initial	of	Test	(days)	(MPa)	Mode		
Load / Prog. Load		Product Code	Slump/Super(mm)	Measured		Avg. Diameter Height		(hrs)	Cap						
15/06/18	08:27	MTS	32	1.2	T9281A	100.4 196	2440	24	2	G	18/06/18	3	25.5	N	Sampling AS 1012.1 Cl 6b
N/A		T9281	20	IV	T9281B	100.3 197	2420	2	2	G	18/06/18	3	25.0	N	Concrete Temp. (°C): 22
N/A		Bio-San -	80/N/A	80/N/A	T9281C	100.0 196	2480	6	6	G	22/06/18	7	32.0	N	MTS; Lab Sample No:205791
					T9281D	99.9 195	2480	6	6	G	22/06/18	7	32.0	N	
					T9281E	100.0 194	2460	27	6	G	13/07/18	28	42.5	N	
					T9281F	100.3 195	2460	27	6	G	13/07/18	28	40.5	N	
					T9281G	100.1 194	2440	27	6	G	13/07/18	28	42.0	N	
					T9281H	99.9 191	2460	89	6	G	13/09/18	90	47.5	N	
					T9281I	100.4 192	2460	89	6	G	13/09/18	90	47.5	N	

Notes

1. Sampling in accordance with AS 1012.1
2. Slump test in accordance with AS 1012.3.1
3. Air content in accordance with AS 1012.4.2
4. Compression specimen compaction by vibration, in accordance with AS 1012.8.1 Clause 7.4
5. Initial curing in accordance with AS 1012.8.1 Clause 9.2.2
6. Standard curing in accordance with AS 1012.8.1 Clause 9.3(a)
7. Capping R - Rubber, S - Sulphur, N - Nil, T - Timber, G - Ground
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9. Density in accordance with AS 1012.12.1
10. Moisture condition SSD in accordance with AS 1012.12.1, unless otherwise stated

Remarks

Failure Mode: N = Normal
 Compaction: IV = Internal Vibrator



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Corporate Site #: xbh

Concrete Shrinkage Test Report

Report No: SHR:WMT-18/06384-C01

Issue No: 2

This report replaces all previous issues of report no 'SHR:WMT-18/06384-C01'.

Client: XYPEX AUSTRALIA
 190 Toongabbie Road
 Girraween NSW

Project: AS 1478 Compliance Tests for Admixture Xypex BIO-SAN C500

Accredited for compliance with ISO/IEC 17025 - Testing



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 Number: 547

Approved Signatory: Robert Camilleri
 Date of Issue: 14/09/2018

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CONCRETE SHRINKAGE TEST REPORT

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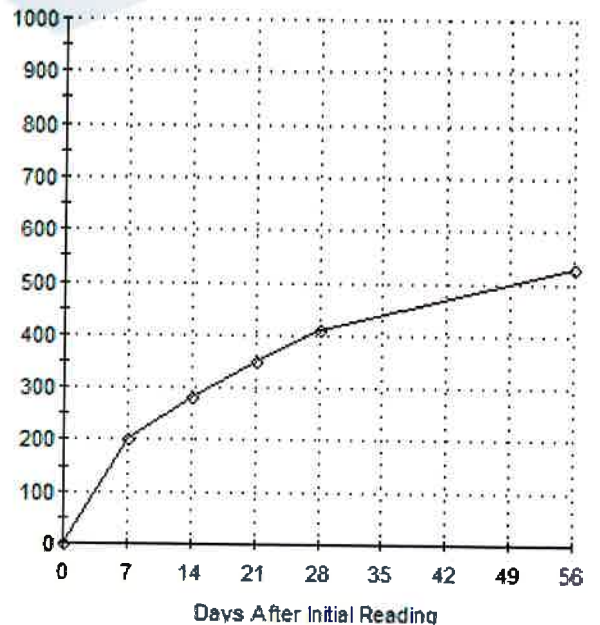
Plant	Field Sheet	Product	Docket	Sample Time	Initial Cure Hours	Actual Slump	Despatch Date/Time	Condition Received	Demould Date/Time	Received Date/Time
MTS	T9281	Bio-San - duplicate	T9281	08:27	24	80	N/A N/A	SSD	16/06/2018 N/A	16/06/2018 N/A

Location: MTS; Lab Sample No:205791

Site Min Temp (°C): N/A
 Site Max Temp (°C): N/A
 Date of Moulding: 15/06/2018
 Initial Reading: 22/06/2018

Drying Period (days)	Test Date	Drying Shrinkage (MicroStrain)			
		Specimen #1	Specimen #2	Specimen #3	Average
7	29/06/2018	196	196	216	200
14	6/07/2018	276	280	296	280
21	13/07/2018	332	352	360	350
28	20/07/2018	408	408	416	410
56	17/08/2018	524	536	536	530

Mean Drying Shrinkage (MicroStrain)



Comments

* - Readings outside of 40 median have been excluded from the average