Confidential BCE Doc 97/177 (M)
Report on Tech-Dry Water

Confidential BCE Doc 97/177 (M)
Report on Tech-Dry Water Repellent Block Wall System to ASTM E514-90 'Standard Test Method for Water Penetration and Leakage Through Masonry'
September 1997
By
B.L. Schafter and B. Budgen

Report on
Tech-Dry Water Repellent Block Wall System to ASTM E514-90 'Standard Test Method for Water Penetration and Leakage Through Masonry'

By Barry Schafer
&
Bev Budgen
September 1997

Please address all enquiries to:
The Chief
CSIRO Building, Construction and Engineering
PO Box 56
HIGHETT VIC 3190

COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION
BUILDING, CONSTRUCTION AND ENGINEERING
REPORT FOR

Tech-Dry Water Repellent Block Wall System to ASTM E514-90 'Standard Test Method for Water Penetration and Leakage Through Masonry'

Product name Tech-Dry Water Repellent Block Wall System
Application Tasco Brick Block & Pavers
26 Bass Highway
Round Hill
Burnie, Tasmania

B L Schafer, B Budgen
Officers Conducting Test
Date 30.9.97

Report on Tech-Dry Water Repellent Block Wall System to ASTM E514-90 'Standard Test Method for Water Penetration and Leakage Through Masonry'

By Barry L Schafer & Bev Budgen Officers of CSIRO BCE

9th September 1997

On Thursday 28 August, a wall built from nominal 200mm wide by 200mm high and 400mm long blocks was tested to 'ASTM E514-90' Standard Test Method for Water penetration and Leakage through Masonry' at CSIRO BCE, Highett site. The blocks were supplied by Tasco Bricks Block and Pavers of 26 Bass Highway, Burnie, Tasmania.

The wall was 2.5 blocks wide and 8 courses high (see Figure1). The mortar was made to the following specifiction as set out in Tasco specification sheet, 'Specification Tech Dry Mortar' (January 1997).

> The Tech Dry mortar is mixed at the rate of two (2) litre of additive to 20 litres of water. Cement ratio must be 1 to 3 using a 'fatty brickies sand'. Neither plasticisers nor lime should be added to the mix.

The wall had been constructed on the 9th of July 1997.

The test method applies water at a rate of 138 l/m and there is a positive pressure between the wet side and observation side of 500Pa. The ASTM method requires the test to last for a period of 4 hours. Figure 2 shows the test chamber attached to the wall and Figure 3 shows the inside of the chamber with the test in progress.

Note: 500 Pa equates to a base wind speed of about 33m/s or 120 km/h
for walls of low rise buildings and only subjected to a positive pressure coefficient.

Results

Within a few seconds of the pressure being applied a small damp spot appeared in the top left hadn perpend of the wall. This spot initially grew in size to 65mm then proceeded to retract. At the end of the 4 hour period it was 55 mm long.

At 2 hours, a second damp spot appeared in the fourth perpend from the base also at the left hand edge of the wall (see Figure 4). Some water was noticed in the cavity of one core on the web three courses down from the top. The amount of water at this location was initially enough to spill over the width of the web and drop further down the cavity (see Figure 5).

As the pressure box extended over the base of the wall onto the supporting channel, some water penetrated the jucntion between the channel and the wall. Water that penetrated this junction was not considered relevant to the test as the test was only meant to be on the masonry wall. The extension over the junction between the supporting channel and the wall was required as there were insufficient blocks supplied to build an additional course at the top of the wall which would have enabled the pressure box to be fitted to the wall only.

Discussion

At the end of the 4 hour test period, with the only two damp spots visible on the non-wet side of the wall, both of which were retracting, the wall could be considered as being an effective against wind driven rain. Whilst this is a qualitative test, it was noted that the water penetration at the two mortar joints would be approximately equal to an area of 0.04% of the wall after 4 hours.

As the two damp spots were retreating, the test was continued for a duration of 4 days. By 24 hours the two damp spots had retrated to half their initial size, and at the end of the four day period had completely disappeared (see Figure 6). This would indicate that the samll passage that wa allowing water to track to these two location homogenously healed during the test period.

Conclusion

Walls build with this system could be considered as waterproof against wind driven rain if they are free of cracking. It would be considered prudent to include weep holes to drain any water which may drain down the hollow cores of the block walls.

Barry L Schafer B Budgen

Figure 1. Wall

Figure 2. Test chamber

Figure 5. Water through mortar - 2 hours

Figure 6. Close-up of dried out mortar

CSIRO AUSTRALIA

Improving the Built Environment

CONSOLIDATED TILING SERVICES

1 September 2000
Our Ref. EN 13/713

TEST REPORT No. 1716

Requested by: Tasco Brick Block & Pavers
On: 10 August 2000
Manufacturer: Tasco Brick Block & Pavers
Product Desc. Tech-dry Concrete Masonry Unit
Sampling details:
Where: Delivered
Date: 10August 2000
By whom: Courier
How (methods): N/A
The results reported relate only to the sample(s) tested.
No responsibility is taken for the accuracy of the sampling unless it is done under our own supervision.

SUMMARY OF TESTS PERFORMED:

ASTM C1262-95 Standard Test Method for Evaluating the Freeze – Thaw Durability of Manufactured Concrete Masonry Units and Related Concrete Units.
Tiles damaged after test: NIL PASS

CERLABS European Network of National Ceramic Laboratories – Australian Member

Report No. 1716
DETERMINATION OF FROST RESISTANCE
TEST BASED ON ASTM C1262-95 TEST DATE: 1 September 2000
Standard Test Method for Evaluating the Freeze – Thaw Durability Manufactured Concrete Masonry Units and Related Concrete Units.

Number of Specimens	5
Bath	Fresh water
Compressive Strength	not required
Defects before testing	NIL

Date and Place 1 September 2000, Highett, Vic.

GEOFF QUICK
STONE SCIENTIST
TECHNICIAN

PETER WESTGATE
SENIOR LABORATORY

CSIRO
AUSTRALIA

Improving the Built Environment

CONSOLIDATED TILING SERVICES

21 November 2000

Our Ref. EN 13/713

TEST REPORT No. 1782

Requested by: Tasco Brick Block & Pavers

On: 21 November 2000

Manufacturer: Tasco Brick Block & Pavers

Product Desc. Tasco Tech-dry Concrete Masonry Unit

Tasco Tech-dry Mortar

Product size 110mm x 228mm x 75mm

Sampling details:

Where: Delivered

Date: 21 November 2000

By whom: Tasco

How (methods): N/A

The results reported relate only to the sample(s) tested.

No responsibility is taken for the accuracy of the sampling unless it is done under our own supervision.

SUMMARY OF TESTS PERFORMED:

Test based on AS 3700 – 1988

Flexural Strength by Bond Wrench Average: 0.449 MPa

Report No. 1782

Flexural Strength by Bond Wrench Test

TEST BASED ON AS 3700 – 1988

Samples received 15 November 2000 Test Date 21 November

Flexural Strength

Sample No.	Mpa
1.	0.357
2.	0.260
3.	0.589
4.	0.426
5.	0.627
6.	0.371
7.	0.308
8.	0.445
9.	0.430
10.	0.681
Average	**0.449**

Interpretation of results: The Tasco Techdry Masonry Unit with Techdry Mortar show a close and continuous range for the Flexural Strength test . The average of 0.449 Mpa is considered a high result for masonry products.

Date and Place 21 November 2000, Highett, Vic.

BARRY SCHAFER
PETER WESTGATE

APPRAISALS MANAGER
SENIOR LABORATORY TECHNICIAN

VICTORIA UNIVERSITY

July 6, 1995

Reference: BPSU/120

Technical Data:

Subject: Salt erosion resistance of concrete blocks

Salt water erosion test data for: Standard concrete block

Concrete block containing Tasco/Tech-Dry Block Emulsion

CONTENTS

1.DESCRIPTION OF SUBSTRATES

Four grey blocks of dimensions (WxDxL) 39x9x19 cm were supplied.

Two of the blocks were marked "Standard 1 and Standard 2" and the other two were marked "Treated 1 and Treated 2".

2. TEST METHOD

The blocks were oven dried 70C overnight, cooled and weighed. All blocks were placed in a bath of 10% Sodium Sulphate under ahead of 15mm for 5 hours and cooled. This process constitutes 1 crystallisation cycle. The blocks were re-weighed and then put through the next cycle. The test was conducted for a total of 15 cycles.

3. RESULTS

The weight loss of the blocks after 15 cycles are presented in Table 1.

Table 1 . Weight loss of the tested substrastes after 15 cycles

Samples	Initial weight (Kg)	Final weight (Kg)	Weight loss (% by weight)
Standard 1	10.256	9.026	12.0%
Standard 2	10.240	9.062	11.5%
Treated 1	10.260	10.230	0.3%
Treated 2	10.258	10.218	0.4%

The results show that the inclusions of Block Emulsion reduces the weight loss after 15 cycles from 12% to approximately 0.4%. Additionally, the Treated blocks were intact at the end of the test, whereas the standard blocks were destroyed by sat erosion.

Signed : Dr.D A Kagi Date 6/7/1995

VICTORIA UNIVERSITY

Aug 15, 1995

Reference: BPSU/128

Technical Data:

Subject: Water Absorption of concrete blocks

Water absorption data for:: Standard concrete block

Concrete block containing Tasco/Tech-Dry Block Emulsion

CONTENTS

1.DESCRIPTION OF SUBSTRATES

Four grey blocks of dimensions (WxDxL) 39x9x19 cm were supplied.

Two of the blocks were marked "Standard 1 and Standard 2" and the other two were marked "Treated 1 and Treated 2".

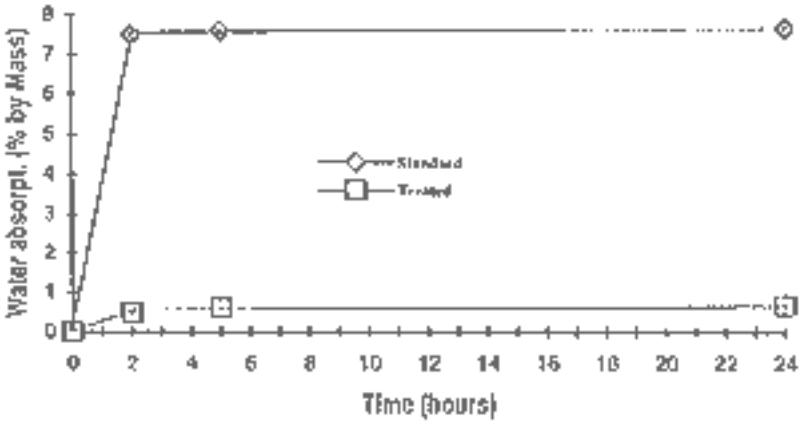
2. TEST METHOD

The blocks were oven dried 70C overnight, cooled and weighed. All blocks were placed in a water saturated polyurethane sponge in a water bath according to DIN52617. The mass of the blocks was measured at 2, 5 and 24 hours.

3. RESULTS

the capillary water absorption versus time is presented in Table 1.

Table 1.



The results show that the inclusions of Block Emulsion reduces the capillary water absorptionfrom 7.7% to 0.7% by mass. This represents an overall reduction of water absorbtion of 90%.

Signed : Dr.D A Kagi Date15/8/1995

6 April 1998

Mr Grant Carter
Tasco Blocks & Pavers
26 Bass Highway
ROUND HILL
BURNIE TAS 7320

Dear Grant

I'm pleased to inform you that your Tech-Dry Water Repellant Blocks performed well in our testing regime.

The samples of block supplied were prepared along Granosite's guidelines as follows:

i) Primed with GranoPrime, then
ii) Overcoated with
   a) GranoImpact
   b) GranoSkin

Followed by air drying overnight.

Adhesion tests were carried out on both systems via AS 1580.408.4-1993 Adhesion (cross-cut) in the dry state and after water immersion.

Based on the samples supplied to us our findings were as follows:

	RATING	
	Dry	**Wet (Water Immersion 24 hr)**
GranoImpact	0 (Excellent)	1 (Very Good)
GranoSkin	0 (Excellent)	0 (Excellent)

0 being no delamination 5 being total delamination

I trust these results are sufficient for your needs.

Yours sincerely
GRANOSITE (A Division of Wattyl Australia Pty Ltd)

Trevor P Brown

Trevor P. Brown
SENIOR CHEMIST

KG:lm

25 February, 1997

The Manager,
Tasco Blocks, Bricks & Pavers,
26 Bass Highway,
ROUND HILL.
BURNIE. 7320

Dear Sir,

Regarding Tasco Tech-Dry block. Our company carried out adhesion tests on this product using our Dynatex Clay and Masonry Render and a 3:1 sand cement render modified with Special M.

The renders were applied to both wetted substrate and dry substrate block.

Results show that both the standard Clay and Masonry render and the Special M modified render show good adhesion to the block surface when applied at a thickness of approximately 3 - 5 mm. The wetted out substrate showed better adhesion than the dry substrate and we would recommend all surfaces to be rendered should be dampened down with water before rendering.

The best overall results were demonstrated by the Dynatex Clay and Masonry render over the wetted substrate.

Yours faithfully,
A.V. SYNTEC PTY.LTD.

Paul Bull
TECHNICAL DIRECTOR

VICTORIA UNIVERSITY

October 18, 1995

Reference: BPSU/134

Technical Data:

Subject: Water absorption of mortar containing Tasco/Tech-Dryad Mortar Additive.

Water absorption data for:: Standard mortar containing Tasco/Tech-Dryad Mortar Additive

CONTENTS

1.PREPARATION OF SUBSTRATES

Materials.

Cement - standard Type A cement

Sand - bricklayer's sand

Gauging Liquids - Reference: Water

Samples 1,2 &3: Tasco/Tech-Dry Mortar Additive dissolved in water in a ratio

of 1:10.

Preparation method :

The sand and cement was dry blended until homogenous. the gauging liquid was added until the desired consistency for laying obtained. The wet mortar was cast in PVC rings of dimensions 75mm Dia x 300 deep. The discs were de-moulded after harding overnight and let cure at 20C/50% R.H for 28 Days. All samples were cast in triplicate.

Sample Composition

Table 1 shows the composition of mortar samples.

Sample	Cement (gm)	Sand (gm)	Gauging Liquid (gm)
Reference	300.0	990.0	195.0
Samples 1,2&3	300.	990.0	191.4

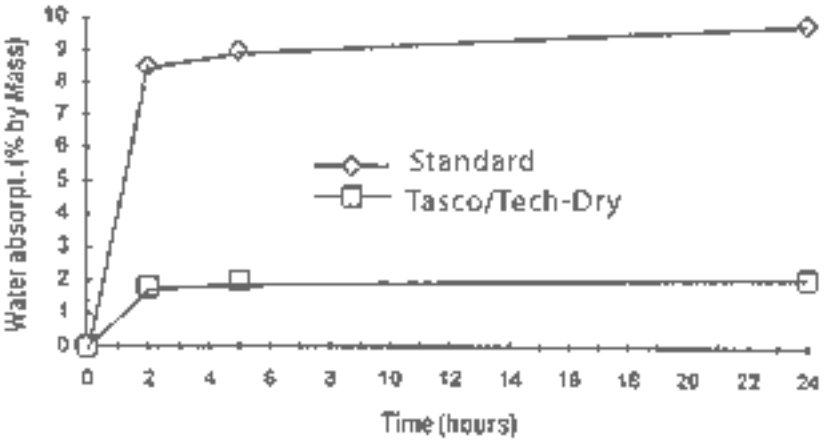
2. TEST METHOD

After curing, the discs were oven dried at 70C overnight, cooled and weight. All discs were placed on water saturated polyurethane sponge in a water bath according to DIN52617. The mass of discs was measured at 2, 5and 24 hours.

3. RESULTS

The capillary water absorption versus time is presented in Graph 1.

Graph 1.



The results show that the inclusion of Tasco/Tech-Dry Mortar Additive reduces the capillary water absorbsion of the mortar from 9.9% to 2.1% by mass. This represents an overall reduction of water absorption of 79%.

Signed : Dr.D A Kagi Date18/10/1995