



BRICK & MORTAR RESEARCH LABORATORY

A trading division of Tamli Pty Ltd. ACN 096 925 325 ABN 54 273 292 917

FACTORY 2, 2 HORNE ST HOPPERS CROSSING VIC 3029 PH/FAX: (03) 9369 8018 MOB: 0419 592 838 EMAIL: bmrl@bigpond.com WEBSITE: bmrl.com.au

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TEST CERTIFICATE NO 6810

DATE: 17/10/05

SALT ATTACK RESISTANCE OF CONCRETE

CLIENT: Ability Building Chemicals Co
133-135 Northern Rd
West Heidelberg Vic 3081

SAMPLE: Laboratory-made concrete, with and without the admixture known as Efflorein.

MANUFACTURER: S Errey

MANUFACTURED: 30-31/8/05

DATE OF TESTING: 7 September to 17 October 2005

TEST

METHOD OF TEST

Determination of:

Resistance to salt attack

AS/NZS 4456.10-2003

NATA Accredited Laboratory Number 658

The tests, calibrations or measurements covered by this document have been performed in accordance with NATA requirements which include the requirements of ISO/IEC 17025 and are traceable to Australian national standards of measurement. This document shall not be reproduced, except in full.



Stuart Errey
MRACI, C Chem
Director

Test Certificate No 6810

17/10/05

RESISTANCE TO SALT ATTACK – Control concrete

Test solution: sodium sulfate
 Side tested: face
 Test method: method B

Specimen no	1	2	3	4	5
Mass loss, g	0.1	0.8	0.4	0.5	0.1
Stopped at cycle no	30	30	30	30	30

DOES NOT COMPLY with criterion (b) for the Exposure category.

RESISTANCE TO SALT ATTACK – Concrete with Efflorein

Test solution: sodium sulfate
 Side tested: face
 Test method: method B

Specimen no	1	2	3	4	5
Mass loss, g	0.4	0.3	0.6	0.2	0.1
Stopped at cycle no	40	40	40	40	40

DOES NOT COMPLY with criterion (b) for the Exposure category.



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Investigation into the effectiveness of Efflorein in improving salt attack resistance in concrete

Stuart Errey

Director

Brick & Mortar Research Laboratory

17 October 2005

Report no 6810 (part 2)

Introduction

At the request of Ability Building Chemicals Co, manufacturer of Efflorein, some trials have been carried out with the intention of gauging the effectiveness of this concrete admixture in improving salt attack resistance. Concrete specimens, made with and without Efflorein Mark 2, have been tested using AS/NZS 4456-2003 *Masonry units, segmental pavers and flags – Methods of test: Method 10: Determining resistance to salt attack*.

Summary of results

The use of Efflorein Mark 2 (at 1.5% of cement content by mass) had the following effects:

- The water demand of the concrete was reduced by approximately 10%.
- The concrete was more than 6 times more resistant to salt attack, as measured by the mass of particles lost from the specimens after 40 cycles of soaking in salt solution and drying.

Details of the trials

Specimen preparation

Concrete mixes were made from type GP cement and washed concrete sand, at about 300 kg cement / m³. Given the lack of coarse aggregate and the high water/cement ratio (>1) the concrete was expected to be quite porous, even after curing. This mix design was chosen so that the control concrete (without Efflorein) would be very likely to fail the salt attack test.

Efflorein was added to half of the concrete at the rate recommended by the supplier. At water contents judged by eye to give the same workability, the water/cement ratios were 1.19 (control) and 1.08 (with Efflorein).

Concrete was poured into wooden moulds with plastic sheeting underneath, to make slabs 40 mm thick. The slabs were cured for 2 days, including 5 hr at 35°C, and then cut into 50 x 25 x 20 mm specimens for the salt attack tests.

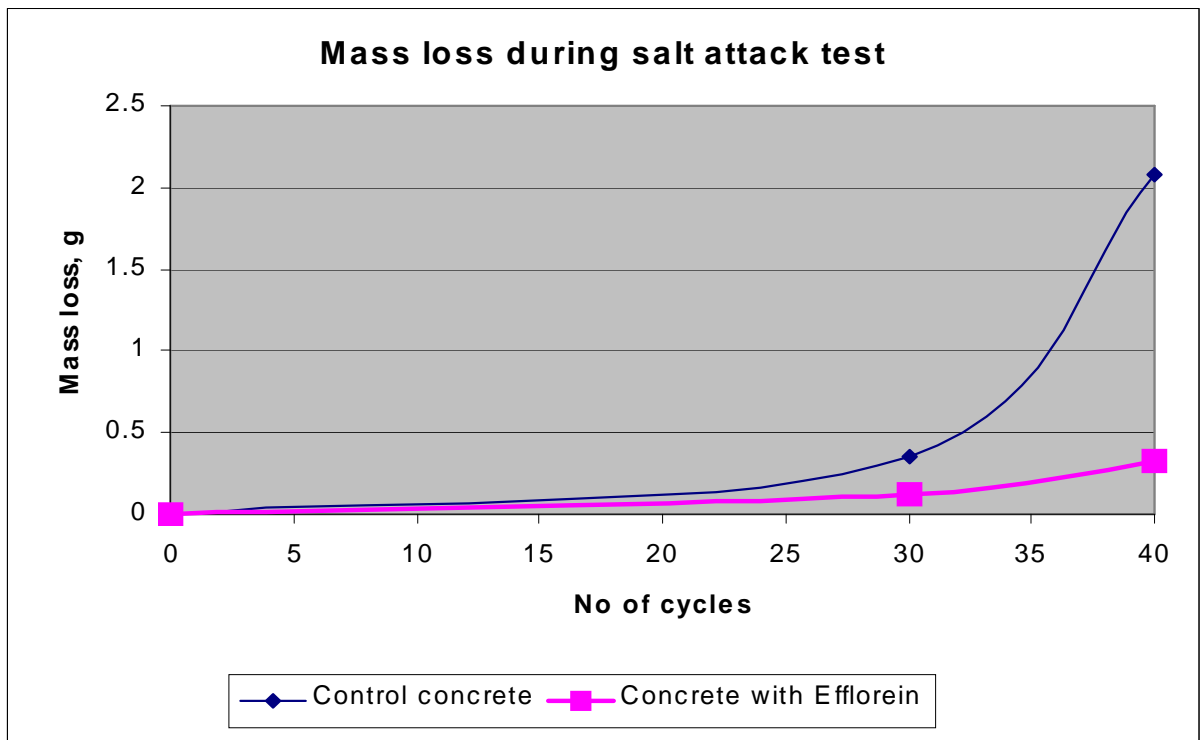
Results and discussion

The NATA-endorsed Test Certificate No 6810 (attached) sets out the mass of particles lost from each specimen at the stage during the tests where each sample was judged to have failed the requirement for being classified as Exposure Grade material. This requirement is that each specimen shall lose less than 0.4g of particles dislodged from the surface while going through 40 cycles of alternately soaking in salt solution and drying.

More detailed data is given in the table and graph below.

No of cycles	Control concrete	Concrete with Efflorein
30	0.36	0.12
40	2.08	0.32

Mean loss (in g) of particles after 30 and 40 cycles.



While both samples failed the salt attack test, the control concrete failed earlier. By the end of the specified 40 cycles, the performance gap between the two was very substantial.

It can be concluded that the addition of Efflorein to this concrete greatly improved its salt attack resistance.