| | | | |
|---|---|---|---|
| **Client:** | International Chem-Crete Co. | **CTLGroup Project No:** | 391241 |
| **Project:** | Product Evaluation | **CTLGroup WR No:** | 38861 |
| | | **CTLGroup Proj. Mgr.:** | J. L. Jones |
| **Contact:** | Radi Al-Rashed | **Technician:** | W. Demharter |
| **Submitter:** | Radi Al-Rashed | **Analyst:** | M. Strow |
| **Date Received:** | February 24, 2015 | **Approved:** | J. L. Jones |
| | | **Report Date:** | June 1, 2015 |

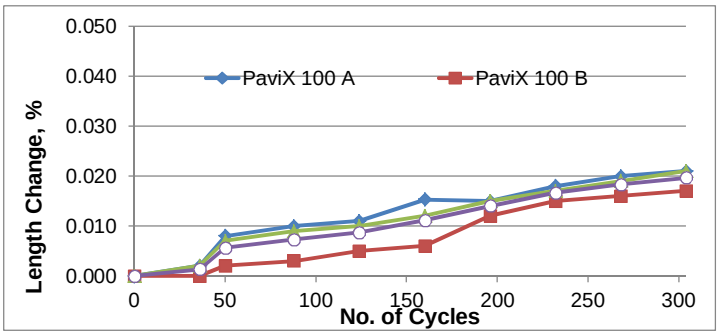
# ASTM C666, Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing Procedure A, Freezing and Thawing in Water

## Summary of Test Results

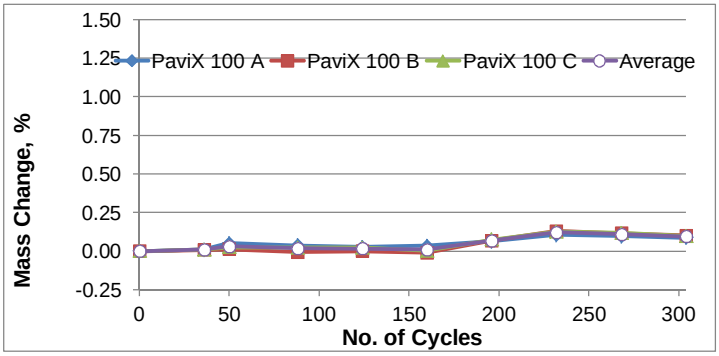
Average mass change at 300 cycles, %: **0.09**

Average durability factor at 300 cycles, %: **97**

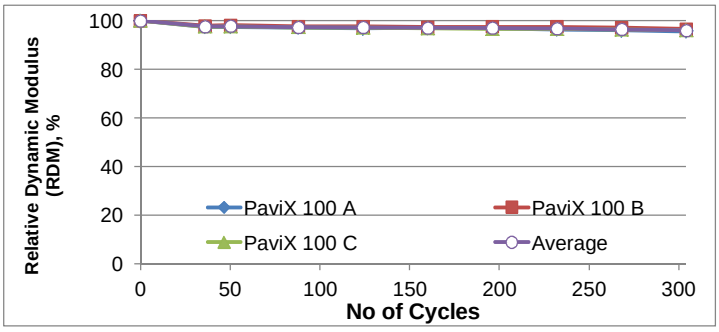
| Freeze-Thaw Cycles | Length Change, % | | | |
|---|---|---|---|---|
| | PaviX 100 A | PaviX 100 B | PaviX 100 C | Average |
| 0 | 0.000 | 0.000 | 0.000 | 0.000 |
| 36 | 0.002 | 0.000 | 0.002 | 0.001 |
| 50 | 0.008 | 0.002 | 0.007 | 0.006 |
| 88 | 0.010 | 0.003 | 0.009 | 0.007 |
| 124 | 0.011 | 0.005 | 0.010 | 0.009 |
| 160 | 0.015 | 0.006 | 0.012 | 0.011 |
| 196 | 0.015 | 0.012 | 0.015 | 0.014 |
| 232 | 0.018 | 0.015 | 0.017 | 0.017 |
| 268 | 0.020 | 0.016 | 0.019 | 0.018 |
| 304 | 0.021 | 0.017 | 0.021 | 0.020 |




| Freeze-Thaw Cycles | Mass Change, % | | | |
|---|---|---|---|---|
| | PaviX 100 A | PaviX 100 B | PaviX 100 C | Average |
| Initial Mass | 3910.0 g | 3967.4 g | 4007 g | -- |
| 0 | 0.00 | 0.00 | 0.00 | 0.00 |
| 36 | 0.01 | 0.01 | 0.01 | 0.01 |
| 50 | 0.05 | 0.01 | 0.02 | 0.03 |
| 88 | 0.04 | -0.01 | 0.02 | 0.02 |
| 124 | 0.03 | 0.00 | 0.02 | 0.02 |
| 160 | 0.03 | -0.01 | 0.00 | 0.01 |
| 196 | 0.06 | 0.07 | 0.07 | 0.07 |
| 232 | 0.11 | 0.13 | 0.13 | 0.12 |
| 268 | 0.10 | 0.12 | 0.12 | 0.11 |
| 304 | 0.09 | 0.10 | 0.10 | 0.09 |




| Freeze-Thaw Cycles | Relative Dynamic Modulus, % | | | |
|---|---|---|---|---|
| | PaviX 100 A | PaviX 100 B | PaviX 100 C | Average |
| 0 | 100 | 100 | 100 | 100 |
| 36 | 98 | 98 | 98 | 98 |
| 50 | 98 | 98 | 98 | 98 |
| 88 | 97 | 98 | 97 | 97 |
| 124 | 97 | 98 | 97 | 97 |
| 160 | 97 | 97 | 97 | 97 |
| 196 | 97 | 97 | 97 | 97 |
| 232 | 97 | 97 | 97 | 97 |
| 268 | 96 | 97 | 96 | 96 |
| 304 | 96 | 97 | 96 | 96 |




Notes:

1. Test specimens were fabricated at CTLGroup on February 10, 2015. As requested, sample were cured in limewater at 73°F for 14 days followed by curing in air at 73°F and 50% RH for 14 days. After 28 days, the samples were coated with Pavix 100 at 175 $ft^2$/gal. Samples continued curing for 14 days in air prior to test preparations.
2. Test specimens measure approximately 3 x 3 x 11 inches at 0 cycles.
3. A negative mass change indicates mass loss; a positive mass change indicates a mass gain.
4. The relative dynamic modulus was determined by the transverse frequency method of ASTM C215, Section 9.
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Client: International Chem-Crete Co.
Project: Product Evaluation
Contact: Radi Al-Rashed
Submitter: Radi Al-Rashed
Date Cast: 02/10/2015

CTLGroup Project No.: 391241
CTLGroup Project Mgr.: J. L. Jones
Specimens Fabricated by: BS, JP
Technician: BS, JP, WD
Analyst: M. Strow
Approved by: J. L. Jones

***CTLGroup Proportions (at SSD Conditions, corrected for yield)***

| *Material* | *Material* |
|---|---|
| Fine Aggregate | 1428 pcy |
| Coarse Aggregate | 1722 pcy |
| Type I/II Cement | 514 pcy |
| Water | 245 pcy |
| MB AE 90 | 0.6 oz/cwt |
| | |
| w/c | 0.48 |

***Fresh Properties:***

| | |
|---|---|
| ASTM C143, Slump | 3 inches |
| ASTM C231, Air Content | 7.0% |
| ASTM C138, Unit Weight | 143.6 pcf |
| Yield | 2.118 $ft^3$ |
| Relative Yield | 1.009 |

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