

Custom Biologicals, Inc.

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Concrete Testing for Con^{mic}Shield Additive Miami Dade Project 9-26-08



biotech armor for concrete

Independent testing performed by world renown President and Director of Research and Applied Technology at *Custom Biological Inc. Deerfield Beach, Florida.*



Dr. Clarence Baugh, PhD

Key Biscayne Manhole Miami-Dade Water & Sewer Authority INSTALLED AUGUST 2001



SEPTEMBER 11, 2008



Bright Red indicates pH <5









Surface Preparation Surface was scraped with a microscope slide to remove a large

part of the slime layer and allow access to the concrete.



SAMPLE PREPARATION

Sample was dried by removing the moisture from the container. Then, sample was cleaned using an alcohol wash and manual brush.



Sample Drying

As the sample dried, debris and slime were easily removed



Sample Cleaning

Alcohol wash was repeated and sample was brushed until concrete was fully exposed.





Test Area The test area was clearly marked.



Indicator Organism Applied by swab to the test location



Storage for Test



The test was stored in a humid, moist area. Wet towels are used to maintain moisture. The container is then covered.



5 Hours After Inoculation

The RED lines are growth of the indicator organism



24 Hours after Inoculation

Samples taken by swab 24 hours after inoculation Show NO presence of the RED indicator organism



Lab Results

Test on concrete surface after alcohol scrub:

POSITIVE

- A positive result indicates that the antimicrobial was present in the sample in enough quantity to inhibit the growth of the indicator organism.
- A negative result indicates that the antimicrobial was NOT present, or it is not present in quantities strong enough to be effective.

CONCLUSIONS

- 1. The specimen from the Miami-Dade test manhole in service since August 2001 was delivered to our lab on September 11, 2008.
- 2. The surface tested at acidic levels of pH 5 as expected from natural acidic conditions on the slime layer.
- 3. E. Coli and similar bacteria were growing on the organic surface material on the slime layer.
- 4. Thiobacillus Thioxidan bacteria were <u>not</u> present because this bacteria will not grow on organic material such as bio-solids.
- 5. The concrete exposed below the slime layer was undamaged.
- 6. The exposed concrete surface killed the indicator bacteria and therefore tested positive for the presence of Con^{mic}Shield additive.





* Test Reports Are Available

ANTIMICROBIAL ACTIVITY OF CONCRETE WAFERS

> Test #970024 4-24-97 Prepared for: Industries, Inc.

> > Prepared by: Clarence L. Baugh # Biologicals,Inc.