

# EFEH & ASSOCIATES

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15 February 1996

Mr. David Twining  
Rhino Systems International, Inc.  
8570 Katy Freeway, Suite 111  
Houston, Texas 77024

Dear Mr. Twining:

EFEH & Associates has performed a 1000 hour salt fog test on sample number J-6946-1 submitted on 2 January 1996. The results of this test are as follows.

## SUMMARY

The asphaltic mat material did not show significant adverse effects from the 1000 hour salt fog exposure. No signs of structural defect or failure were seen in the exposed specimens.

## TEST PROCEDURE

Exposure of the specimen followed the parameters in ASTM B117-90 "Standard Test Method for Salt Spray (Fog) Testing". This test method is applicable to ferrous and non-ferrous metals, and is also used to test inorganic and organic coatings.

A plexiglass chamber meeting the requirements of B117 was used. The construction ensures that no material condensing on the walls or ceiling of the test chamber contact the specimen; and that condensate dripping from the specimen is collected and not allowed to be atomized into the salt fog.

Three specimen pieces were used, each measuring twelve inches by twelve inches. These were hung by the two uppermost corners in the test chamber and supported by glass rods to maintain a 20 degree angle from the vertical. Specimen were placed side by side with six inches clearance between any nearest surfaces. No cleaning or pretreatment was applied to the specimens before testing.

Test exposure was begun on 3 January 1996 and continued for 42 days (1000 hours). Each day, the temperature was checked as well as the pH of the salt solution. These were maintained at 35 +/- 1 C and between 6.5 and 7.2 respectively. Salt was prepared as specified in section 7.1



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of B117 (5 parts sodium chloride to 95 parts deionized water).

## POST EXPOSURE EXAMINATION

After the 1000 hours of exposure were complete, the test specimen were removed from the chamber and rinsed with deionized water to remove any residual sodium chloride. The specimen were examined under a twenty power microscope for cracking, crazing, tears, and other signs of corrosion impact on the integrity of the material.

In general, the test specimen did not show any effects from the exposure. No adverse conditions such as tears or cracks were observed. Each of the three exposed panels appeared essentially alike.

## CONCLUSION

This material performed well in the 1000 hour salt fog test. Section 15.2 from the test method explains the usefulness of the data:

"The salt spray (fog) test is intended to reproduce the corrosion that occurs in atmospheres containing salt spray or splash. It has been widely observed, however, that rankings of different alloys or coating systems, or both, do not necessarily fall in the same order as atmospheric tests in marine or road splash environments. This test has been more useful in rating the relative resistance of a specific type of protective coating, for example, hot-dip zinc coatings on steel. Interpretation of the results of this method beyond this purpose must be verified by actual exposure tests."

Enclosed are photographs before and after exposure as well as a copy of ASTM B117. If there are any questions, please contact me.

Sincerely,



Edwin B. Smith, III  
Quality Assurance Manager