A PRELIMINARY EVALUATION OF THE SALT SPRAY RESISTANCE OF Z.R.C. ZERO VOC

Report #: 980420

Client: Z.R.C. Worldwide
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ATTN: Mr. Steve Collins

Date: April 17, 1998

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SUMMARY:

Salt spray evaluations of the Z.R.C. Zero VOC over a 17000 (seventeen thousand) hour exposure has shown excellent long term performance with no blistering and minimal scribe corrosion. Similar evaluations of the same material over smooth, non-blasted Q-Panels has shown no blistering nor general attack after 9200 (nine thousand, two hundred) hours and only slight corrosion at the scribe with no undercutting. Adhesion remains excellent after this exposure in spite of minimal surface preparation.

OBJECT OF STUDY:

To examine the application properties of Z.R.C. Zero VOC and evaluate its resistance to salt spray.

PROCEDURES:

Applications of Z.R.C. Zero VOC to sandblasted and non-sandblasted steel surfaces were made by spray techniques. Additional application trials were made by brush. No surface preparation other than solvent wiping was performed over the smooth steel surfaces. Panels were allowed to cure at 75°F and 50% relative humidity for two weeks, then backed and scribed, and placed into the 5% salt spray test environment. It was the intention to run these coatings to complete failure.

In evaluating the panels these characteristics were examined. General corrosion breakdown of the field of the panel (ratings being made according to the ratings scale of the pictorial standards noted in Figure I of ASTM D-610), scribe attack (rating being made according to a transparent template configured to the ratings scale noted in Table I of ASTM D-1654), and blistering resistance. Blistering resistance was evaluated for both the degree of blistering and the size of the blisters developed. Criteria to be used in this case were the pictorial standards of Federal Standard Method TT-P-141a, Test Method 6461, which is similar to ASTM D-714, except that the ratings for blistering degree are numerical on a scale of 0-10 (complete blistering – no blistering) instead of descriptive.

Panels were exposed in 5% salt spray until appreciable deterioration was evident. At this time, panel tape was redressed and panels were photographed.

FINDINGS:

Mixing and spray application of the material was found to be easy, and films deposited were wet, and showed no evidence of sagging or dry spray. Similar application of the same material by brush onto panels (not subsequently tested) showed easy brushability. Some brush marks remained in the dry film, though coverage was complete.

Results of this testing may be reviewed in Table I and in Figures 1 and 2. Neither of the two panels under evaluation showed any severe corrosion loss for many thousand hours. The non-blasted Q-Panel was eventually removed from the test after 9200 hours. At the end of this exposure only at the scribe was any corrosion visible. There was no undercutting, blistering nor creepage of corrosion from the scribe, however. The film on the sandblasted panel was allowed to remain in test for 17000 hours. At the end of this time, some breakdown of the general panel was beginning. At the scribe, corrosion showed no blistering nor undercutting and minimal creepage. No blistering was evidence on either panel during the entire period of testing. Adhesion remained excellent. While this was perhaps not unusual in the case of the sandblasted panel, the blistering resistance performance of the coating system on the smooth steel Q-Panel was very surprising.

CONCLUSION:

Long term salt spray exposure of the Z.R.C. Zero VOC Zinc Rich Primer has shown excellent performance of the product over both sandblasted and smooth steel surfaces. The adhesion, blistering resistance and corrosion resistance of the *non-sandblasted panel* was both extraordinary and impressive for an inorganic zinc rich primer. Scribe corrosion on both panels was light, and creepage was minimal.

Prepared and respectfully submitted,

Clive H. Hare, Inc.

Clive H. Hare,
President

Table I: 5% Salt Spray Evaluation of Z.R.C. Inorganic Zinc "ZRC ZERO VOC"

Panel	Substrate/Surface Preparation	Exposure Time	General Panel Attack	Scribe Attack	Blistering
#1	Smooth, Polished Q-Panel Solvent Wash Only	9,200	10	8	10/10
#2	SSPC-SP-5 White Blast	17,000	7	8.5	10/10

Fig. 1: Showing condition of Z.R.C. Zero VOC on smooth, non-blasted, clean steel after 9,200 hours 5% salt spray exposure.

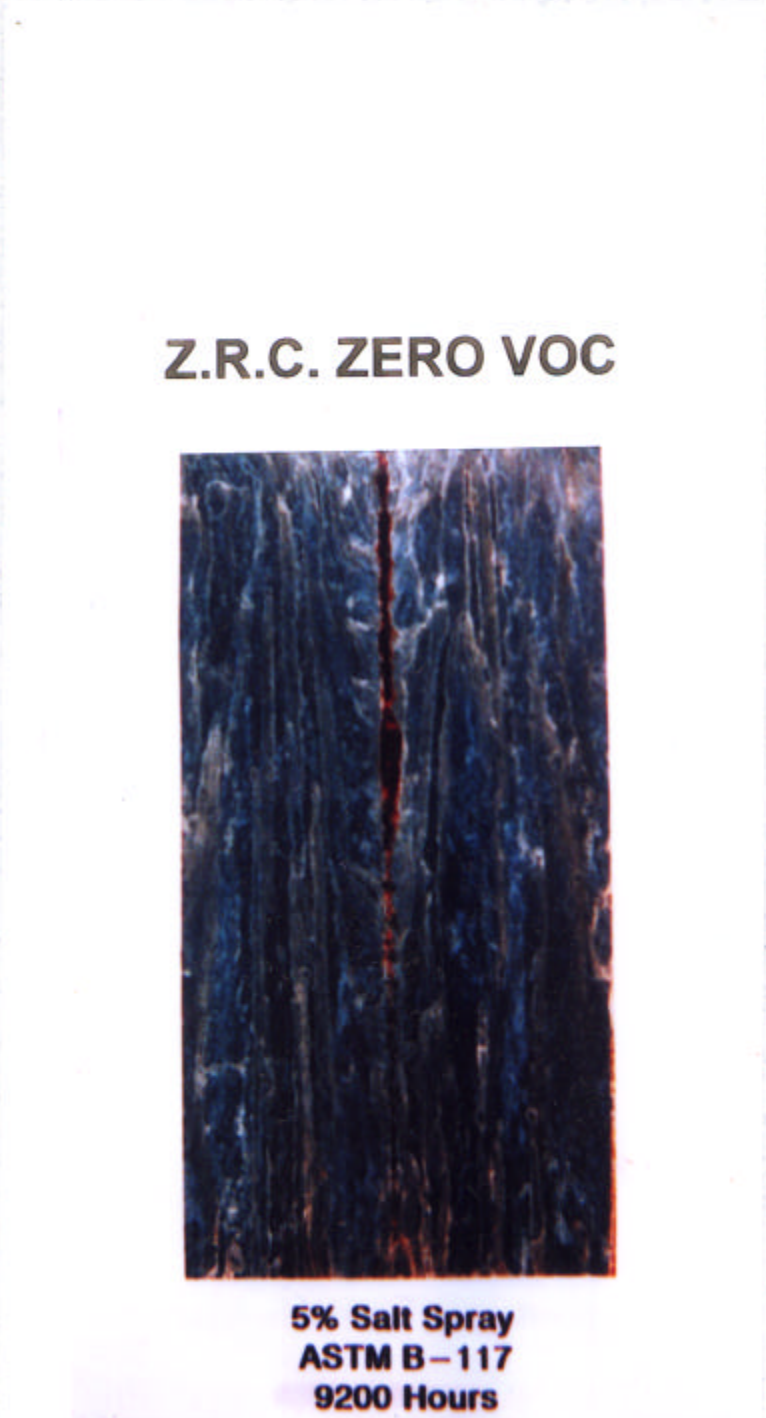

Fig. 2: Showing condition of Z.R.C. Zero VOC on SSPC-SP-5 white blasted steel after 17,000 hours 5% salt spray exposure.

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Re: - Addendum to Report # 980420 on the exposure of the Zero VOC ZRC.

Dear Mr. Collins,

In furtherance to your request of last week, we have now located the panels of Zero VOC ZRC primer discussed in Report #980420 and measured the film thickness using a Positector 6000 magnetic/electronic film thickness gauge. While it is preferable to measure the film thickness of such films before (instead of after) exposure, we do not feel that differences due to the reinforcing effect of zinc corrosion product should adulterate the determinations too much. We are, therefore, reasonably confident of the accuracy of these values.

Film thicknesses of both panels were averaged over some nine points on each panel. The non-blasted panel bearing the film that had been exposed for some 9000 hours averaged 4 dry mils. The blasted panel on which the Zero VOC ZRC was spray applied and which lasted for 17000 hours was a little thicker and averaged 5.5 dry mils.

Trusting that the above fulfills your requirements, we remain,

Yours very truly,

CLIVE H. HARE, INC.,

Clive H. Hare
President.