Shield Technologies Corporation Summary of

"Corrosion Prevention Benefits of Sheltering Aerospace Ground Equipment, Final Report, dated May 2008"

The US Air Force Corrosion Prevention and Control (AFCPC) Program command conducted a one year long scientific study from March 2007 through April 2008 with the stated purpose of demonstrating the benefit of storing Aerospace Ground Equipment (AGE) in sheltered storage versus outside, unprotected storage. Prior to commencement of the study, Shield Technologies Corporation (STC) had the opportunity to brief AFCPC personnel about Envelop Protective Covers technology. AFCPC staff took an immediate interest in the technology and decided to include Envelop Protective Covers and traditional vinyl covers in the study to achieve a more comprehensive look at potential solutions for corrosion prevention.

STC designed and produced a cover to be employed in the sheltering study, specifically for the USAF New Generation Heater (NGH). The cover was delivered to Travis Field ANGB, Savannah, GA in March 2007 and installed on a NGH for testing, to be stored outdoors. Corrosion sensors, environmental monitors and bare metal coupons were placed with each test asset. The end result of the study demonstrated scientifically that Envelop Protective Covers are more than ten times as effective in reducing corrosion than the next best solution (vinyl covers) and nearly twenty times as effective as storage in simple shelters. Data contained in the final report, dated May 2008, will be summarized in the following pages and will highlight outstanding performance as well as address minor concerns expressed by the AFCPC.

The Executive Summary of the report details the challenges the Air Force faces with its limited AGE assets and the effects of the operational tempo. ***"With AGE being left in the Southwest Asia (SWA) area of operations (AOR) for longer periods and exposed to the harmful effects of the corrosive sands in the region, it is crucial that all viable methods of corrosion mitigation be evaluated for implementation."*** Additionally, the report identifies a need for corrosion prevention efforts throughout the Air Force, ***"Protection of these assets should not begin in SWA but at all the home locations."***

The following data demonstrate the superior effectiveness of Envelop Protective Covers compared to other solutions tested in this study. The corrosion coupons show graphic evidence of the difference between simple shelters, traditional vinyl covers and Envelop Protective Covers. ***"Perhaps the most surprising result involved the favorable effects of covers. The results in Figure B1 would indicate a degree of protection far greater than 10:1. This conclusion is also supported by the appearance of steel in Figures B5 and B7."***

Six unique metals coupons on each card, including ferrous metal on the left.

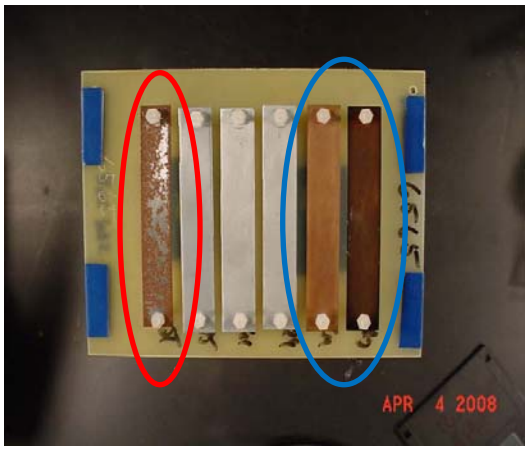

Figure B3. Test Card Exposed Inside Shelter at Travis Airfield ANGB for period 5/07 – 4/08

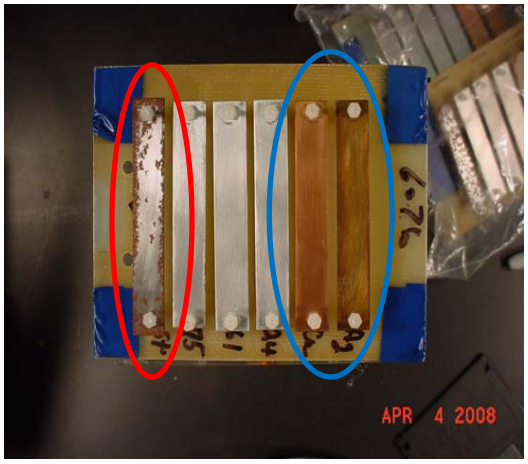

Figure B5. Test card Exposed under L&G (vinyl) Cover on AGE Equipment outdoors at Travis ANGB; 5/07 – 4/08.

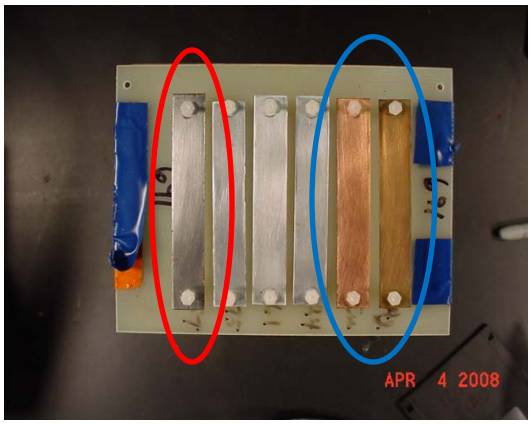

Figure B7. Test Card Exposed Under Envelop Cover on AGE Equipment Exposed Outdoors at Travis Field ANGB; 5/07 – 4/08.

The data detailed in the table below provide a stark demonstration of the difference of the tested solutions regarding metal lost to corrosion after 13 months.

	Chloride (a)	2024 Al (b)	Steel (b)
Travis Field ANGB Outside	1946	173	10639
Travis Field ANGB Shelter	253	16 ©	1772
Travis Field ANGB Envelope Cover	63	14 ©	97
Travis Field ANGB L&G Cover	211	11 ©	1035
Pease ANGB Outside	1380	77	25005
Pease ANGB Shelter	450	17	2124
Holloman AFB Outside	190	56	9231
Holloman AFB Shelter	105	11	7927

(a)Chloride film thickness
(b)Weight Loss, micrograms/cm^2
(c)Statistically the same and not different from zero

Chloride film levels, a significant corrosion catalyst, are nearly three times lower with Envelop Protective Covers than the next best solution. Metallic weight loss data shows that Envelop Protective Covers reduce corrosion on ferrous metals more than ten times better than the second best solution (vinyl covers) and nearly twenty times better than simple sheltering.

The sheltering report did address two minor concerns in employing Envelop Protective Covers as a solution. The first, ***"One difficulty with individual covers is that it usually takes more than one person to put the covers on the equipment. This is especially an issue with the tight-fitting Envelop covers."***, is easily addressed by modifying the design to meet the users' desires for fit and function. The Envelop Cover provided was installed by one person upon delivery. The second concern expressed regarded VCI life, ***"The Envelop cover has a VCI as a component that will need to be periodically replaced. A VCI insert must be added under the cover (at an additional cost) when the VCI stops discharging"***. In reality, the VCI component in an Envelop cover will last approximately five years before being expended. The expected life of the Envelop Protective Cover will range between two years in a harsh, at-sea environment to greater than five years in a protected area. The VCI can be easily replenished if the cover is still serviceable, with the VCI component being quite inexpensive.

The bottom line of this USAF Sheltering study is a positive demonstration that sheltering provides better protection for AGE assets than outdoors storage by a margin of at least 2:1. The unintended, but indisputable, conclusion supported by the data shows that Envelop Protective Covers provide the best protection in terms of corrosion reduction by an order of magnitude.

Given these unbiased findings, all DOD program managers concerned with corrosion prevention of valuable military assets should consider Envelop Protective Covers in developing their corrosion prevention and control programs.

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