



Lektro-Tech

A Corrosion Protection & Solutions LLC Company
Manufacturer of Anti Corrosion Products and Lubricants

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Announcement

SUBJECT: Super Corr-A Solvent testing for worldwide use

Product:

Mfg. Code: 12-351

Boeing Code: 12-371

NSN: 6850-01-528-0653

MIL-SPEC: 87177A, Type I and Type II, Grade B

Under contract with the US Air Force, Battelle Memorial Labs under the name "*Super Corr-A Corrosion Prevention Compound Solvent Replacement*" the final report is completed qualifying testing for a universal replacement solvent carrier for Super Corr-A. Previously used solvent carrier was no longer accepted in several countries of the European Union due to environmental concerns on 1 January 2009 necessitating the need to re-qualify a replacement solvent carrier.

Both Kyzen's Corp Cybersolve C141R and DuPont's Vertrel SDG proved to be superior to previous used solvent carrier AGC Chemical AK225T solvent. This was consistent with results obtained in previous studies completed by Battelle and referenced in the final report. Battelle was not able to find any incompatibilities with the new solvent's. Super Corr-A's effective ingredients remained unchanged.

Attached are pages from the final report:

- Cover page dated November 29, 2010
- Acknowledgements (iv)
- Introduction 1.0; Objective 1.1; Background 1.2 (page 1)
- Conclusions (page 38)

A handwritten signature in black ink, appearing to read "Robert Kay". The signature is fluid and cursive, with a large loop at the end.

Robert Kay
Managing Member
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DUPLICATE

Super Corr-A Corrosion Prevention Compound Solvent Replacement

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Ms. Shaina Robitaille, 508th ACSG/ENX
Mr. Wayne Patterson, 809th MXSS/CLA

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Mr. Ron Knight, Lektro-Tech, Inc.
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Ms. Jackie Pignatiello
Dr. Dale Schaefer

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Mr. Xuecheng Dong

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Mr. Felix Fernandez
Ms. Vicki Paddock

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1.0 Introduction

The Super Corr-A lubricant has been proven to provide a high degree of corrosion resistance when utilized on electrical connectors in mild or moderately corrosive environments. However, AK225T, a commercial solvent blended in the current lubricant formulation, has been classified to contain two Class II Ozone Depleting Substances (ODS)s, which have been banned in Europe and Canada. With expectations that the use of the ODSs will be prohibited in the United States by 2015, an alternative, commercial-off-the-shelf (COTS) solvent blend that meets or exceeds the performance of the current lubricant, as well as not being registered on the Class II ODS list, needs to be validated for replacement.

1.1 Objective

The objective of this study was to conduct an independent laboratory and field assessment of COTS alternatives to the HCFC-225ca and HCFC-225cb solvents currently formulated in the MIL-L-87177A approved lubricant, and to validate the performance on avionic and structural aircraft components. These alternate formulations are being investigated because of environmental and regulatory concerns related to the existing solvents used in the manufacture of the current commercial product. The results obtained from all laboratory and field assessments conducted in support of this program are summarized in this final report.

1.2 Background

Battelle conducted several previous laboratory and field studies^{3,4} for the Air Force to evaluate the performance of a MIL-L-87177A, Type I, Grade B synthetic water displacing lubricant or corrosion preventative compound (CPC) (referenced as Super Corr-A, NSN 6850-01-528-0653) for use on F-16 Line Replacement Unit (LRU) electrical connectors. This COTS material was designed to conform to the corrosion protection requirements specified in MIL-L-87177A and MIL-C-81309E. Ground- and flight-based testing conducted by Battelle and the Air Force demonstrated that this material provides a high degree of corrosion inhibition, reducing the possibility of failure due to engineering or performance risks to the treated electrical connectors.

The current formulation of Super Corr-A has a proven performance in sufficiently cleaning the surfaces of electronic and structural subsystems in USAF aircraft, as well as effectively displacing and preventing the ingress of moisture and other contaminants from the connector surfaces that initiate corrosion and component degradation or failure. However, the commercial solvent (i.e., AK225T) in the current formulation of the lubricant contains the Class II Ozone Depleting Substances (ODS) HCFC-225ca and HCFC-225cb, which have been banned for use in the European Union and Canada. It is also anticipated that the use of these ODSs will be prohibited in the United States beginning in 2015. This test program is intended to (1) identify a less environmentally hazardous COTS replacement solvent, and (2) validate its performance on avionic aircraft components.

³ Abbott, "Lab and Field Testing MIL-L-87177A Corrosion Preventative Compound (CPC)," Contract No. F45620-00-D-0030-0012 to OO-ALC, Battelle (January 30, 2005).

⁴ Abbott, "Effects of Corrosion Inhibiting Lubricants on Improved Reliability of Avionics," Contract No. F42620-00-D-0030-RJ06 to WR-ALC/LYE, Battelle (July 31, 2003).

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4.0 Conclusions

A summary of the conclusions obtained from the laboratory and field testing completed in support of the subject investigation is provided in the following text:

- First article testing completed by SMI Inc. in accordance with the requirements specified in MIL-L-87177A confirmed a need to update or revise the specification to reflect an applicable set of performance requirements for the CPC lubricants
- Both of the compliant solvents (i.e., DuPont Vertrel SDG and Kyzen Cybersolv C141R) downselected for investigation by Corrosion Protection & Solutions performed well when compared to the performance of the Super Corr-A and Super Corr-B lubricants
- The corrosion-resistant properties of the experimental formulations blended with the two compliant solvents and higher concentrations of proprietary corrosion preventative compounds was equal to, or greater than, additional lubricants approved per MIL-L-87177A and MIL-PRF-81309F
- Laboratory testing completed by students at the University of Cincinnati and Battelle identified superior corrosion protection performance for the D-5026NS, CPC No. 3 and CPC No. 4 lubricants
- A majority of the results obtained for the experimental formulations of Super Corr-A and Super Corr-B investigated in this study are consistent with the results obtained in previous studies completed by Battelle and referenced in this report. Specifically, the lubricant performance was validated; thus no compromise of the integrity of the electrical component/system is expected to occur with use of the experimental lubricant formulations
- None of the experimental formulations blended with the two alternative solvents damaged stressed polycarbonate coupons. Conversely, the CON-TAC material and the lubricants formulated with the 141-B solvent were the only materials that damaged the polycarbonate coupons in the testing conducted during this study.