



VCI-FREE BARRIER MATERIAL PROGRAM



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OBJECTIVE:

- Identify, Procure and Conduct Testing of Commercially Available Alternative Corrosion Protective Barrier Materials. This would:
 - Eliminate Need for Volatile Corrosion Inhibitor (VCI) for Environmental reasons
 - Allow Better Protection to Ammunition which cannot be exposed to VCI.



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SUMMARY:

- Program Sponsored/Funded by the Logistics Research & Development Activity(AMMOLOG)
- TACOM-ARDEC, Packaging & Engineering Support Division Conducted Market Survey, Identified Commercially Available Non-VCI Corrosion Preventing Material Types:
 - Barriers
 - Desiccant
 - Copper-impregnated Polyethylene Barrier Material



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SUMMARY continued

- Detailed Test Plan was developed by Picatinny and Logistics Support Activity at the Packaging, Storage and Containerization Center (LOGSA PSCC) at Tobyhanna Army Depot, PA.

Test Plan included:

- Material Strength tests, Water Vapor Transmission Rate (WVTR) tests
- Rough Handling tests



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SUMMARY continued

- Salt-fog test on Specimens Comprised of Metal Coupons inside Barrier bags for one year with monthly inspections.
- MIL-B-131 barrier material and VCI-wraps were tested as benchmarks for comparison.

Completed Following tests:

- Material Strength tests, WVTR tests, Salt-Fog tests, and Rough Handling tests.



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PRELIMINARY EVALUATION:

- Both Copper-impregnated Polyethylene barrier material, and a Plastic Container with a Desiccant insert have shown good corrosion prevention of test specimens during exposure in salt-fog chamber.
- MIL-B-131 material showed superior performance in material properties. Material Strength and WVTR test results for alternative barrier materials seem acceptable.



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PRELIMINARY EVALUATION continued

- Copper-impregnated Polyethylene barrier material yielded more time to initiation of corrosion than MIL-B-131.
- Cost of alternative barrier materials ranges between two to four times that of GSA supplied MIL-B-131 material.
- Any flexible barrier material requires a good quality control practice during manufacturing and during packaging because of its being prone to punctures, cuts and “pimples”.



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CONCLUSIONS:

- Certain alternative barrier materials have shown promise.
- Alternative barrier materials have higher cost.
- Specific applications on critical items may offset the higher cost.

STATUS:

- Predictive Thermal Aging tests are in progress. A final report containing complete evaluation of alternative barrier materials will be published.
- Looking for candidate applications