

# Chemical Agent Resistant Coatings Development

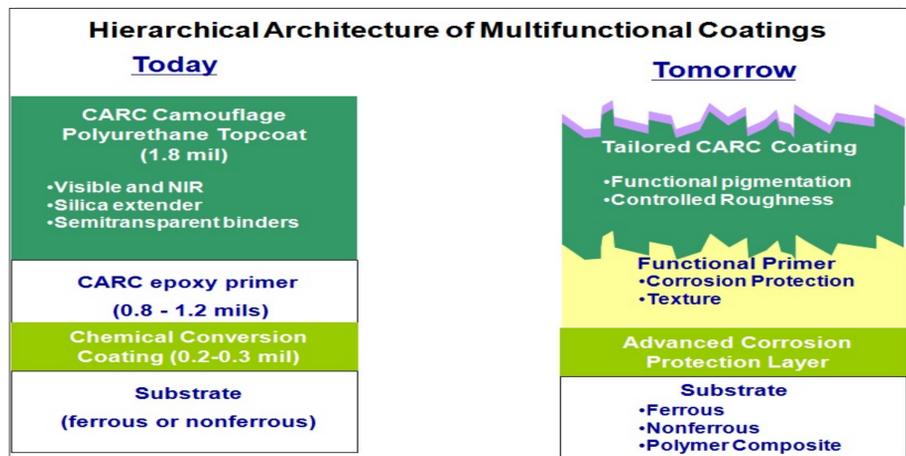


**S&T Campaign: Materials Research**  
 Tier 2 Manufacturing Science, Processing & Sustainment

John A. Escarsega, (410) 306-0693  
 John.a.escarsega.civ@mail.mil

## Research Objective

- Coatings are being developed to meet survivability, environmental, durability and application gaps currently associated with chemical agent resistant coatings (CARC).
- Specific chemistries such as non-isocyanate based coatings and high performance pretreatments for multi-metal substrates are being formulated that meet military applications. Currently no such coatings exist.



## ARL Facilities and Capabilities Available to Support Collaborative Research

- Extensive Paint and Coatings laboratory facilities.
  - Reflectance spectrophotometers, weathering chambers, high speed mixing and dispersers and spray booths to apply coatings.
  - ARL has extensive and in-depth coating formulation expertise and on site coating application capabilities.
  - ARL is the DOD approving authority for chemical agent resistant coatings. Key specifications to review are
  - MIL-DTL-53072; CARC Application Specification
  - MIL-C-490 F; Pretreatment Specification
  - MIL-DTL-64159, 53039 & 34208; Water Dispersible, Solvent & Powder based topcoat systems
  - MIL-DTL- 53022 & 53030 ; Solvent & Water based epoxies
- ❖ INITIAL Findings in regard to new coating systems:
- Data suggest that to meet existing requirements such as chemical agent resistance, coatings must possess both surface modification and an extensive cross linked polymer network which compliment one another for highest resistivity to chemical agents.

## Challenges

- No commercial coatings or current polymer systems exist to replace existing camouflage topcoats nor pretreatments which can be used on multi-metal substrates and cure at ambient conditions.
- Limited data of long term performance of novel chemistries and poor correlation of accelerated weathering methods create additional challenges to screen or predict failures or promising candidates.

## Complementary Expertise/ Facilities/ Capabilities Sought in Collaboration

- Expertise in coating formulation and accelerated weathering.
- Pigment treatment capabilities or polymer synthesis to provide starting material for CARC systems.
- Application or pretreatment processing to assist in application of pretreatments.

