Optimizing CARC Improvements For Army Weapon Systems

What is CARC?
A polyurethane paint, CARC extends the service life for military vehicles and equipment. More specifically, it:
• Provides signature reduction (camouflage) in combat zones
• Offers corrosion protection
• Provides superior resistance to chemical warfare agent penetration
• Greatly simplifies decontamination activities

Why Switch to New CARC Formulations?
The U.S. Environmental Protection Agency has proposed the Defense Land Systems and Miscellaneous Equipment (DLSME) National Emission Standard for Hazardous Air Pollutants (NESHAP). This NESHAP would regulate the coating operations for the majority of DoD materiel. Affected equipment includes tactical vehicles, ground combat vehicles, tactical shelters, and munitions. In preparation of this NESHAP, the older CARC formulations are being discontinued.

Military Benefits of New CARC Formulations
In comparison to the older CARC formulations, the new formulations:
• Contain no hazardous air pollutants (HAPs) and has a lower content of volatile organic compounds (VOCs)—up to a 65% reduction in emissions
• Are more durable
• Produce less overspray when applied, which improves spray booth visibility
• Reduce materials usage up to 40% and lower application times by up to 35% due to improved application efficiency
• Have the potential for reduced material, clean-up, waste disposal, and life-cycle costs

MIL-DTL-53039B, Type I
- Single component
- Solvent-based
- Silica-based flatteners
- 3.5 lb. VOC/gal.
MIL-DTL-53039B, Type II(S)
- Single component
- Solvent-based
- Silica-based flatteners
- 1.5 lb. VOC/gal.

Existing CARC

Newer CARC

MIL-DTL-64159, Type II
- Plural component
- Water-dispersible (WD)
- Polymeric bead flatteners
- 1.8 lb. VOC/gal.
MIL-DTL-3039B, Type II(P)
- Single component
- Solvent-based
- Polymeric bead flatteners
- 1.5 lb. VOC/gal.

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The National Center for Energy and Environment (NDCEE) and U.S. Army Environmental Command (USAECC) are helping installations overcome challenges, real or perceived, to implementing new chemical agent resistant coating (CARC) formulations: MIL-DTL-64159, Type II, water-dispersible CARC (WD-CARC); and MIL-DTL-53039B, Type II-Polymeric, a solvent-based, single-component CARC.

In 2008, Forts Benning and Stewart, Georgia, as well as Anniston Army Depot, Alabama, were beneficiaries of the NDCEE/USAECC assistance. This assistance included conducting technology demonstrations, providing coatings application training, and procuring technologies that improve the mixing and application process. All three installations have or plan to switch to one of the new CARC formulations. A fourth demonstration is planned for Fort Wainwright, Alaska.

The NDCEE and USAEC have supported the implementation of low-VOC, HAP-free CARC formulations at several Army facilities. In 2008, Forts Benning and Stewart, Georgia National Guard personnel received coatings application training on strategies and techniques that will enable them to use less coating and improve finish quality.

NDCEE
National Defense Center for Energy and Environment
DoD Executive Agent
Silica Technology of the Army
(Installations and Environment)
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Technology Transfer Assistance
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