

REDUCTION OF THE PACKAGED WEIGHT OF THE DF-200 DECONTAMINATION FOAM FORMULATION

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Sandia National Laboratories has reconfigured its DF-200 decontamination formulation to meet the CBW agent decontamination requirements of the DOD with significantly reduced weight and volume. Of primary interest and benefit to the warfighter is the use of one formulation for battlefield and fixed site decontamination that is easily deployable, fast reacting, environmentally friendly with low toxicity and corrosivity properties, and that has a *low logistics burden*. Currently, the aqueous-based DF-200 is provided in an 'all-liquid' configuration where all water is included within the packaged formulation. Although this configuration of DF-200 makes it easy to use (by quickly mixing each of the three liquid parts) it requires a significant logistics burden since each gallon of the formulation weighs approximately 9 lbs. A new granulated (i.e., powder) configuration of DF-200 has been developed that can be packaged with all water removed. This reduces the packaged weight of DF-200 by ~60% and significantly lowers the logistics burden on the warfighter. Water (freshwater or saltwater) can be added to the 'reduced weight' formulation at the time of use from a local source.

The development of this new 'reduced weight' configuration of DF-200 represents a considerable technical challenge. During the development process, the following criteria were considered:

- High storage stability in extreme temperature environments
- Rapid solubility of the ingredients in both freshwater and saltwater
- Low cost (e.g., use of commercially available ingredients)
- High efficacy against both chemical and biological warfare agents
- Ability to maintain sufficient contact time between the formulation and the agents on both vertical and horizontal surfaces in all deployment conditions
- Ability to be easily deployed with existing military equipment

To accomplish the objective, the development process focused on four tasks.

- Selection of a solid hydrogen peroxide material that is stable under high temperature storage conditions.
- Development of methods to rapidly dissolve solid peroxide materials in water.
- Development of 'reduced weight' formulation components.
- Efficacy testing of the 'reduced weight' DF-200 configuration.

This presentation will discuss the development of the 'reduced weight' configuration of DF-200 including the advantages and disadvantages of this configuration as compared to the standard 'all-liquid' configuration. The presentation will also compare the efficacy of the 'reduced weight' configuration to the 'all-liquid' configuration of DF-200.