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Decontamination Of Chemical Contaminants From Sub-zero To Hot Temperatures

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Laboratory evaluations of decontaminant performance are typically performed in well-controlled ambient environments to provide confidence in results. Different temperature environments may alter the effectiveness of a decontaminant, depending upon its composition. Aqueous decontaminant formulations may be subject to freezing, which limits applicability and interaction with contaminants. Whereas elevated temperatures may increase the rate of reaction for decontaminants with the contaminants, increasing their efficacy.

The Decontamination Sciences Branch at DEVCOM CBC has developed the capability to perform decontaminant evaluations inside a temperature-controlled enclosure, capable of producing environments between -40°C and 50°C. The enclosure also meets safety standards for work with neat chemical contaminants.

The efficacy of the Decon Slurry, originally developed at DEVCOM CBC, was evaluated against two contaminants over a range of temperatures from -32°C to 43°C, using pipette application on polyurethane coatings for decontamination times of 30 min and 4 hr. The results show that the decontaminant remains as a liquid and can be applied at temperatures as low as -32°C, while still providing decontaminant performance. These studies also show that the formulation can be used in arctic environments, where other decontaminants would not be able to be applied.

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