# INVESTIGATION OF NOVEL RESPIRATOR SEAL CONCEPTS

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The U.S. Army Edgewood Chemical Biological Center has initiated a research effort to investigate novel seal concepts and technologies for the next generation of joint service respirators. Advanced seal technologies are vital for the development of highly protective integrated systems designed to meet the needs of the future warfighter. These needs include increased protection against chemical warfare agents toxic industrial chemicals and biological pathogens; reduced physiological burden; and increased comfort for extended wear. Encapsulated gel technology is being explored as a potential solution for enhanced sealing systems. The main emphasis is on conformal seal concepts that provide significant improvements to the protection and overall comfort of the respirator system. The objective is to develop an integrated mask sealing system that conforms and adjusts to dynamic changes in the face seal to minimize the frequency and amount of leakage. Various candidate gel and skin materials are presently being assessed and down selected based on several key mechanical properties such as durometer hardness elongation and tensile strength. The next phase of the project will involve developing one or more gel-based peripheral seal concepts that are integrated with a full-facepiece respirator. The prototype masks will be used as a test bed to demonstrate concept feasibility. A review of these and related seal technology efforts will be presented.