



Standard Practices for Qualitatively Evaluating the Comfort, Fit, Function, and Durability of Protective Ensembles and Ensemble Components¹

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INTRODUCTION

Workers involved in the production, use, storage, maintenance, and transportation of chemicals can be exposed to numerous substances capable of causing harm upon contact with the human body. The deleterious effects of these chemicals can range from acute trauma, such as dermatitis or burns, to chronic degenerative disease, such as cancer or pulmonary fibrosis. Since engineering controls may not eliminate all possible exposures, attention is often given to reducing the potential for direct skin contact through the use of protective clothing that resists degradation, penetration, and permeation.

Chemical-protective ensembles range from outfits of gloves, boots, and coveralls to totally-encapsulating ensembles employing self-contained or airline-supplied, breathing apparatus. The ensemble of chemical-protective clothing in combination with gloves, boots, a breathing apparatus, and other auxiliary protective equipment can provide maximum protection to wearers in situations when no contact with hazardous chemicals is permitted. Chemical-protective ensembles are often selected on the basis of material chemical resistance, but equally important are the comfort, fit, functionality, and overall integrity of the ensemble allowing the wearer to safely carry out his or her assigned tasks. Few standards, if any, apply to the design and manufacture of chemical-protective ensembles. Additionally, protective clothing designs vary depending on different end use applications in industrial settings, hazardous waste site clean up, and emergency response. As a consequence, users are faced with a variety of commercial products and generally depend on manufacturer sales information to decide which protective clothing is appropriate for their own application. Other protective equipment such as gloves, boots, respiratory protective equipment, communications systems, and cooling devices must also be selected and integrated with the chemical-protective clothing to provide an ensemble with adequate protection.

This standard is intended to provide standardized methods for qualitatively evaluating the comfort, fit, function, and durability of chemical-protective ensembles and ensemble components. It may also be used by protective clothing manufacturers to assess current or proposed designs.

1. Scope

1.1 These practices are intended for evaluating chemical-protective ensembles and ensemble components to determine

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the suitability of the ensemble or ensemble components in a work environment on the basis of its comfort, fit, function, and durability.

1.1.1 *Option A* is a manned exercise scenario intended to test the strength and durability of the ensemble components.

1.1.2 *Option B* is a manned work task scenario intended to determine human factor characteristics and the ability of the suited test subject to perform tasks that may be encountered on a routine basis in a typical work environment.