



LOW COST DISPOSABLE FLAME RESISTANT COMBAT COVERALL| WarSTAR

OVERVIEW:

U.S. Army tankers, and aviators of all services, are required to wear flame resistant clothing made from Nomex/Kevlar (aramid) fiber blend fabrics. Although these materials receive high user ratings they are too expensive to issue to all military users. The infantry, which uses a nylon and cotton blend fabric, needs flame protection, but Nomex/Kevlar uniforms are too expensive to issue to every infantryman. A new non-woven coverall made from aramid fabric was developed to provide flame protection that is affordable, quickly deployable, and improves the survivability of the individual soldier.

DESCRIPTION:

To reduce costs, a novel approach to soldier flame protection was pursued. A non-woven fabric structure was selected, using direct fiber to fabric manufacturing eliminating the costs for yarn spinning, fabric weaving, and finishing. A spun-laced non-woven aramid fabric developed by Dupont demonstrated strength that was equal to or greater than the former all-cotton Hot Weather Battledress Uniform (BDU) and half the weight. Due to its lightweight, open, air permeable construction it can be worn over the existing combat uniform and together this configuration provides a 40 percent cost savings over the existing camouflage printed aramid Aircrew BDU used by Army aviators. Instrumented manikin testing demonstrated that when the commercial aramid coverall (Limitedwear®) was worn over the standard BDU the total body burn was reduced from 88 to 8 percent. Safe exposure limits up to 5 seconds were established. The non-woven aramid coverall provides ignition resistance, and the under-layers of the BDU, t-shirt and briefs provide thermal insulation. Commercial-off-the-shelf (COTS) "Limitedwear" coveralls were evaluated at Ft. Lewis, WA and the Ranger Training School, Dahlonge, GA.

KEY FINDINGS:

The COTS coveralls needed to be re-designed, re-sized and hardened to support military applications. A new version was developed that included a camouflage printed fabric, water and oil repellent treatment, elasticized waist, seat, wrists, and ankles. In addition, a new sizing system with increased ease was developed, a larger covered two-way zipper was added, as well as knee, seat, and elbow patches. Instrumented manikin testing demonstrated that poly/cotton, cotton, and Nomex long underwear can be safely worn under the coverall instead of the BDU, and that Integrated Body Armor, with Deltoid protection can be worn either over or under the coverall. Cost estimates are \$50.00 per coverall and it can be worn and laundered for at least 10 workdays.

STATUS:

The military version of the coverall is available for purchase through DSCP and the GSA schedule.

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