

Treatment of Firefighter's Suit against Fire to Increase Its Effectiveness

Dr/ Eman Raafat Saad

Clothing Department, Faculty of Applied Arts, Helwan University, Cairo, Egypt

Abstract:

Great efforts have been tried through the late years to increase the suitability and effectiveness of Firefighters suit. These efforts were done to protect the wearer from harsh environmental that may result in injury or death. This paper describes flame retardants treatment of fabrics which used in the firefighter suit to prevent and slow down fires in fabric and clarify that using the most effective flame retardants could save lives and prevent burn injuries. This paper examined the efficacy of two fire retardant substances, PF-phosphorus / nitrogen compound based and PR 20-organo phosphorus-based. The fabric samples were burned before and after machine washing with soap. Methodology was undertaken using a number of three different firefighter suit materials, with fiber content of 100% cotton, PES/cotton and 100%PES. Both treated and untreated fabrics were examined using a number of test methods; first, the flammability test, second, physical and comfort properties, finally, thermal conductivity. Fabric before and after treatment has been analyzed by using Fourier transforms infra-red spectroscopy to show the effect of the treatment on the fabrics. The resulting work of PF-phosphorus / nitrogen compound based treatment did not drained, and was found to be durable.

Keywords:

Protective clothing, Firefighter suit, flame retardants, functional properties, infra-red spectroscopy.