

**AntifUEgo: Incorporating Chicken Eggshells and Oyster Shells  
in Jute Fabric as an Alternative Fire Retardant Textile**

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**ABSTRACT**

The alternative fire -retardant textile AntifUEgo which is made up of jute cloth, oyster, and chicken eggshells is the focus of the study. Sustainable solutions are essential as fire accidents increase worldwide. Oysters and eggshells are investigated for their fire-retardant qualities since they contain an abundance of calcium carbonate ( $\text{CaCO}_3$ ). The foundation fabric is of jute, renowned for its sustainability and toughness. This study assesses tensile strength, shrinkage, air permeability, and flammability by testing varying concentrations of eggshell and oyster shell solutions (Set A: 95%-5% and Set B: 90%-10%) on jute fabric against untreated jute fabric (Set C) and synthetic fire-retardant textile (Set D). The AntifUEgo solution is produced by mixing powdered shells with an acrylic copolymer binder and treated using a quantitative, quasi-experimental method using four set-ups with four trials on each test totaling 64 samples. The mentioned tests were done using the modified ASTM protocols. The data was analyzed using descriptive statistics and dependent and independent t-tests. Results show that Set A is better in all categories than Set B, which makes it the optimal ratio of the study. Against Set C, the optimal ratio significantly improves air permeability and flammability, with minor differences in shrinkage and tensile strength. Furthermore, against Set D, the

optimal ratio shows negligible differences in shrinkage, air permeability, and flammability with a significant difference in tensile strength. The study achieves inference by creating a fire-retardant textile that is sustainable and cost-effective with a versatile application.

*Keywords:* fire-retardant textiles, agricultural waste, eggshells, oyster shells, jute fabric