

APPLICATION OF JUTE TREATED WITH FLAME RETARDANT IN HOOD AND TRUNK LINING

Ibrahim, G., E.,

Science & Arts 2004

Abstract

Trunk linings, Fabrics usage in the trunk linings industry return to year 1985 when the trunk has become an extension of the car interior. The main requirements are low cost, light weight and mauldibility , achieved by resignation. Generally the trunk linings has to be insulated against incident heat and thus additional heat barrier is thus necessary between the trunk and the interiors

Hood lining , The hood liner is simply a covering for the metal roof inside the car and consisted of a piece of fabric . PVC or some other material , sometimes simply held enplane only at a few points .It has been developed over the last 20 years into a sophisticated module component , important for thermal and sound insulation. The functions of the interiors trim head liner part have evolved during the past several years to being more than just a thermal insulation and interiors cover for the metal roof assembly . Future head liner designs include integrated structures to reduce or eliminate roof bows for a net weight reduction. Also hood liners are used as part of the acoustical package design to make the cars quieter by preventing noise and heat from reaching the passengers compartment

A variety of materials are used for packaging fabrics, sacking bags, floor covering ...etc. , these products including natural fibers such as jute and sisal. No attempt has been made to develop hood liners and roof panels , which require stability at very high temperatures . This research describes the physical mechanical and thermal properties of these fabrics

Jute, The use of natural materials is being examined and in fact is being used in some cars .Jute is an example of natural fibers used in this branch , as jute fiber is available in plenty and a comparatively low cost. So it is being increasingly used to produce diversified products such as carpets , low cost blankets , upholstery ...etc. (11) Now jute, as a new trend has emerged in the manufacturing of industrial textiles as civil engineering and transportation .

Jute fibers consists of cellulose 58 – 63% hemicellulose 20-22% Lignin 12-14 % , wax and fats .4-.8% protein 0.8% – 2.5% and mineral 0.6-1.2% . Jute has many important characteristics including agro – renewability , ecofriendliness , bio- degradability , durability , better tensile strength , anti statistic property , low thermal conductivity , moderate moisture regain , good insulation property, good affinity towards various classes of cellulosic dyes and compatibility in blending with other allied . For previous characteristics jute fibers were chosen to be used in this research for producing samples used in hood and trunk linings.

Flame retardant ,The need for reducing the flammability of cellulose has been recognized for several centuries .At the present time several countries have regulations restricting the sale or use of the dangerously flammable textiles.

In the past decades, a number of chemical procedures have been developed to reduce the flammability of cellulosic substrates. However, only a few are still being practiced. Currently, the durable flame retardant finishing systems for cellulosic fibers are available to the industry. Flame retardant can be obtained in two ways by using inherently flame retardant fibers such as Nmex aramid by treating (coating the fiber or fabric with flame retardant chemicals), where the second method may be less expensive than using inherently flame retardant fibers.

The experimental work

There are no previous studies about using jute for hood and trunk lining. So this study aimed to produce fabrics used in trunk and hood linings, using jute 9 and 12 Libra. Two different woven structures were used in this research to produce all samples (irregular hopsack 2/1 and twill weave 2/1)

Finishing technology

Coating and laminating offer methods for improving and modifying the physical properties and appearance of fabrics and also the development of entirely new products by combining the benefits of fabrics. Flame retardant of textiles is very important for the improvement of safety characteristics of industrial textiles. In addition, flame retardant coating is necessary to improve the fire behaviour of materials as jute burns in the presence of oxygen and high temperature. Reducing the flammability of jute is important for fabrics used in this industry, so all samples produced in this research were treated with flame retardant by fire coat 215 (mixture of Poly Silicate, Bicarbonate Sodium and Diethylene Glycol)

Results and Discussion

Results of experimental tests carried out on the produced samples were statistically analyzed and presented in the following tables and graphs.

Thermal isolation

It is clear from the diagrams that irregular hopsack 2/1 has obtained the highest rates of thermal isolation, whereas twill 1/2 has obtained the lowest rates but the difference is insignificant. It is also obvious from the statistical analysis of the thermal isolation results that there is an inverse relationship between number of ends and picks per cm and thermal isolation. I can report that the increasing in ends and picks cause an obstruction in air passage, causing increasing in thermal isolation.

It can also be noticed from the diagrams that samples made of 12 Libra have recorded the lowest rates of thermal isolation, whereas samples made of 9 Libra have recorded the highest rates. I can report that yarns of 12 Libra have thicker diameter than those of 9 Libra, which cause a decrease in thermal isolation.

I can also notice from the diagrams that there is an inverse relationship between thickness, weight, and thermal isolation. I can state that increasing in thickness and weight means increasing in yarn diameter, number of picks and ends per unit area, which cause an obstruction in air spaces, causing increasing in thermal isolation