

# Deodorised Liners of Husk Fiber with Natural Finishes

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**Abstract**— Nonwoven fabrics are sheet or web structures bonded together by entangling fiber or filaments. They are flat or tufted porous sheets that are made directly from separate fibres like arecanut and organic cotton. In this technique the fibres are directly processed into a fabric instead of yarn stage. Nonwoven provide properties which are often combined to create fabrics suited for specific jobs, while achieving a good balance between product use-life and cost. Since these properties are available in chosen fibre, and so had gone for underarm pad. Under arm pad are an alternative to antiperspirants and can eliminate armpit stains sometimes caused by antiperspirants. It has been finished with fragrance to make the users a fresh appeal to eliminate the usage of perfumes.

**Key words:** Areca nut fibre, Arm pad, Antiperspirants, Fragrance

## I. INTRODUCTION

Among all the natural fibres that are available areca nut acts as a promising material as it is inexpensive, abundantly available and is bio-degradable [1]. Since areca fibre is rich in moisture content, it has been used in the field of non-woven textiles such as arm pads, eye pads, shoe sole, fluffy cushions, etc and the anti-microbial and the anti-fungal property along with good perspiration capacity of areca fibres can be best chosen to solve the requirements of an arm pad liner. Today the arm pad liners include the traditional reusable products and also include newer, disposable products [2]. The disposable arm pad made of areca and cotton was finished with the fragrance such as rose oil and thiruneetrapachillai. This product was made to compete with the commercially available products in the market.

### A. Objectives:

To incorporate a natural fiber product which suits underarm pads and impart fragrance finish in place of deodorant which is also a bio-degradable product.

## II. MATERIALS AND METHODS

### A. Fragrance Finish:

The needle punched fabric made of arecanut and organic cotton was finished with rose oil and thiruneetrapachillai in equal proportions.

### B. Solvent Extraction Of Collected Herbs:

Extraction was carried out dissolving 6 grams of the powder in 100ml of 80% ethanol, kept overnight under shaking condition. Then the extract was filtered using Whatmann no.1 filter paper, filtrate was collected and evaporated at room temperature. The concentrated extract was stored at 4 degree Celsius and used for further studies. (Thiruneetrapachillai extract and Rose oil)

### C. Spray Finish:

The mixture was then filtered through four folds of cheese cloth followed by sterile filtering through a 0.2 filter. Then the arecanut sponge was spray finished using the sprayer.

### D. Wet Type Dips Method:

The method of dipping is done by immersing the cotton knitted fabric material in the treatment bath containing the extract for 1 to 5 minutes with binder 3% and then pulled up from the bath following by squeezing.

### E. Antibacterial Assessment By Eniso 20645:

The antibacterial activity of the finished fabric was tested according to ENISO 20645 against *Staphylococcus aureus* and *Escherichia coli*. Nutrient agar plates were prepared by pouring 15 ml of media into sterile Petri dishes. The plates were allowed to solidify for 5 minutes and 0.1% inoculum was swabbed uniformly and allowed to dry for 5 minutes. The finished fabric with the diameter of  $2.0 \pm 0.1$  cm was placed on the surface of medium and the plates were kept for incubation at 37 °C for 24 hours. At the end of incubation, the zone of inhibition formed around the fabric was measured in millimetres and recorded.

### F. Antifungal Activity Assessment By Aatcc 30 - 2003 Test Method:

An inoculum of 1.0 ml was evenly distributed over the surface of the agar. Fabric samples were placed in intimate contact with potato dextrose agar, which has been previously inoculated (Mat culture) with broth suspension culture of test organisms (*Trichoderma* sp). After incubation, a clear area of uninterrupted growth underneath and along the side of the test material indicates antifungal effectiveness of the fabric.

### G. Antiallergy Assessment Of The Finished Fabric, Contact Allergy Test (In House Method):

The fabrics were patched on the normal skin and observed for the specified period of time for the development of the symptoms leading to contact dermatitis allergy.

### H. Product Development:

The inner and outer layer was made of 100% organic cotton which was of knitted material. The needle punched fabric was stuffed in between the layers of finished organic cotton. It was made into an oval shape to fit under the arm. Elastic was attached on both sides of the arm pad for comfort.

## III. RESULTS AND DISCUSSION

### A. Antibacterial Assessment by Eniso 20645:

S.NO	Treated Fabric	Zone of inhibition (mm)	
		<i>S.aureus</i>	<i>E.coli</i>
1.	Arm pit Liner	31	40

Table 1: Antibacterial assessment of Product



Fig. 1: Shows the Zone of inhibition- Antibacterial assessment of Product

The above result proved the product has good antibacterial activity. So this can be suggested to have activity that restricts bacterial growth.

**B. Antifungal Activity Assessment By Aatcc 30 - 2003 Test Method:**

S. No.	Fabric samples	Zone of inhibition in (mm)
		Trichodermareesei
1	Arm pit Liner	74

Table 2: Antifungal activity assessment of Product



Fig. 2: Shows the zone of inhibition - Antifungal activity assessment of Product

The fungal activity is proven to be effective by the observations made.

**C. Antiallergy Assessment Of The Finished Fabric, Contact Allergy Test (In House Method):**

After the contact time, the fabric patches were removed and observed for the following reactions

- (IR) - Irritant reaction
- (-) - No irritant reaction
- (+) - Weak positive
- (++) - Strong positive

S.NO	Subject	Fabric sample (Finished fabric)
1	Subject 01(female/19 yrs)	-- No irritant reaction
2	Subject 02(female/22 yrs)	-- No irritant reaction
3	Subject 03(female/26 yrs)	-- No irritant reaction

Table 3: Skin allergic - subjective evaluation



Fig. 3: Shows Skin allergic - subjective evaluation

There was no irritation observed and the skin was normal after exposing to the finished fabric. So it is proven to be anti allergic.

**IV. CONCLUSION**

The areca fibers are cost effective ones which is rich in moisture content. It possess good antimicrobial property and it depicts the concept of best out of waste as the heaps of arecanut husk which was going waste was made into a natural fibre and eco-friendly product without harming the nature and as a better by product in the field of textiles.

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