



RESEARCH ON THE DEVELOPMENT OF A SUSTAINABLE DECORATIVE YARN USING ALUMINUM FOIL PLASTIC WRAPPERS.

Narmadha devi V.N., M.Sc.,M.Phil.,NET''

Sree Sruthi. S., M.Sc.,''

Asst.professor, dept of apparel fashion designing

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FASHION

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ABSTRACT:

Sustainable is a keyword in the nanotechnology era. The application of recycling is a backbone in many areas such as Textile food wear, etc. Aluminium foil sheets are been used in many places to carry food parcels covers are eatable. Those are aluminium wrappers are thrown in a dustbin at end of the day. The same is recycled and reused. Here I am attempting the aluminium foil sheets used as weft yarn in the saree borders. It gives a more aesthetic look as well as more strength to the saree. Even though, the saree went for a couple of test yarn strength, elongation, and washing tests.

INTRODUCTION:

This project is based on sustainable fashion products. There are some entrepreneurs who have been introduced to something new about sustainable fashion products. Amble Outdoors and All Birds are creating sustainable products using recycled plastic water bottles. Those products are activewear like jackets, leggings, crop tops, swimwear, and shoes. Here I am attempting to use recycled and reused aluminium foil sheets that are converted into yarns that are applied to cotton sarees.

METHODOLOGY:

SELECTION OF RAW MATERIALS:

COTTON FIBER:

Cotton fibre is one of the highly acclaimed natural fibres under the genus of *Gossypium* made up of cellulose with 1,4-d-glucopyranose structural units. Many studies have been reported on surface modifications of cotton fibres to further enhance their performances, to introduce new features, and also to make compatibility with other surfaces.

PLAIN WEAVE:

Plain weave also called tabby weave, linen weave or taffeta weave is the most basic of three fundamental types of textile weaves along with satin weave and twill. It is strong and hard-wearing, and is used for fashion and furnishing fabrics.

In plain weave cloth, the warp and weft threads cross at right angles, aligned so they form a simple criss-cross pattern. Each weft thread crosses the warp threads by going over one, then under the next, and so on. The next weft thread goes under the warp threads that its neighbor went over, and vice versa.

ALUMINUM FOIL WRAPPER:

Aluminium foil, or tin foil, is a paper-thin, shiny sheet of aluminium metal. It's made by rolling large slabs of aluminium until they are less than 0.2 mm thick. It's used industrially for a variety of purposes, including packing, insulation, and transportation. It's also widely available in grocery stores for household use. At home, people use aluminium foil for food storage, to cover baking surfaces and to wrap foods, such as meats, to prevent them from losing moisture while cooking. People may also use aluminium foil to wrap and protect more delicate foods, like vegetables, when grilling them.

PROCESS:

The research is based on sustainable products. I sourced cotton yarns and aluminium foil sheets as the basic raw materials. The aluminium yarns used in developing this product have a width of 0.01mm. For the motives, I used a flower design and then weaved the weft yarn according to the design. The idea of incorporating the reused aluminium sheets is woven into the saree border. After that, the product was sent to the testing laboratory for identification of the yarn strength, elongation, and washing (bleaching) test.

TEST RESULTS EVALUATE:**YARN STRENGTH:**

Yarn strength refers to the ability of a yarn to withstand tension or stress without breaking. It is an important characteristic of yarn that determines its durability and suitability for various applications. Yarn strength is typically measured in terms of the force or load required to break yarn, and it can be influenced by various factors such as the type of fibre used, the spinning method, the yarn construction, and the finishing processes.

| Single Yarn Tenacity and Elongation UTR-4 InHouse <i>(In House Method SITRA/YP/01-2015)</i> | Y2300210-1 LUREX YARN |
|---|------------------------------------|
| Actual Strength (gf) | 110. 5 |
| CV% of Strength | 4.35 |
| % Elongation | 109. 4 |
| CV% of Elongation | 7.82 |

Fabric bleaching is a process that involves using bleaching agents to remove stains, discolouration, or yellowing from fabrics. There are two main types of fabric bleaching: chlorine bleach and oxygen bleach.

| | |
|-----------------------|--|
| Scoring and bleaching | N2300152-1 Sample particulars at given by customer: cotton+ Jari |
| Bleaching | Bleached |

CONCLUSION:

Cotton yarn and plastic Jari yarn have been combined with sustainable fashion. The conclusions drawn from this experimental investigation are as follows:

- Sustainable and based on composite materials reinforced with cotton and plastic Jari has been successfully fabricated.
- The properties of yarn were tested, its strength, its bleaching property, and scouring tests and were heavily influenced by the yarn used.

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