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Utilization of Waste Jari

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***Abstract*: The motivation behind this project is how to utilize waste jari on fabrics. Real jari, Imitation jari and Metallic jari these are the variety of jari. Jari are mainly used in sarees, dhoti, lehengas and kurtas. Jari are mainly used in sarees, kurtas lehengas and dhoti. Mostly, wastage of jari comes from sarees puttas. In this project, the waste jari is utilized by a grinding method. Resin used for this experiment is epoxy resin. These are the resins are used for applying on the fabric by coating method then pore the waste grinder jari on that fabric. And resin epoxy is applies on the fabric by method of manual and padding method. Test taken for the sample are stiffness, tensile strength and thickness test.**

***Keywords*: Wastage of jari, variety of jari, collection of jari, grinding the waste, coating over the fabric, epoxy resin, adhesion and strength, stiffness, tensile strength, thickness test.**

1. Introduction

Jari is a highly costly material with the raised pattern. It is made by winding or wrapping a metallic strip produced by using gold, silver or polyester film, on the core yarn. The core yarns are usually cotton, viscous, monofilament, silk etc. Nowadays, Jari is classified into three types, real jari is manufacture from gold or silver, imitation jari from copper wire and Metallic jari from polyester metallized film. The main objective of this project was to utilize the waste jari by coating over the fabric. Mostly, the waste jari comes from sarees manufacturing in the weaving industry. For coating the waste jari over the fabric resins will be helpful because resins are used for strength, bindings for two materials. Epoxy resins are produced from bisphenol and epichlorohydrin it provides rigid and excellent adhesive to metal. Epoxy resin is normally used for binding any two products and coating the products, for coating hardener is necessary.

1) Objective of the project

- To utilize waste jari to give lustre coating over the fabric/material and in technical composite materials.
- To collect the waste jari in weaving industry.
- To prepare the epoxy resin using of laminating resin and hardener with ratio of 2:1.
- To treat the cotton fabric (bleached and sized fabric) using of epoxy solution by hand method and padding method.
- To compare the physical properties of the fabric with unfinished fabric for apply in technical composite.

2. Materials and Methods

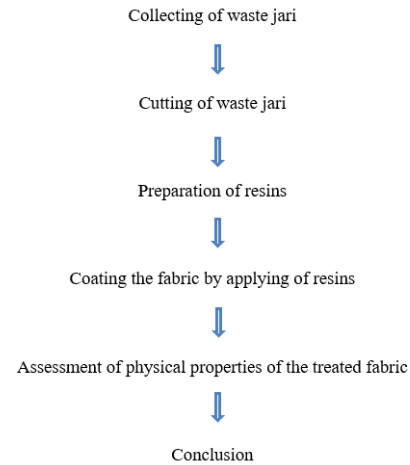
A. Materials

1) Waste Jari

Core of waste jari was obtained by polyester and it was collected in Perundurai in power loom industry. Most of the jari wastes are obtained in extra weft process mainly in sarees. Length of jari waste is differing from 2 to 4 inches according to design of sarees.

B. Methods

1) Methodology



2) Cutting of waste jari

Normally fibres are trashed by grinding method but we cannot able to trash this jari. Because while trashing the fibre heat will generate on that time there is a chances to fire, so jari was cut by manual. The jari waste was separated according to length sequences. Cut the jari waste by scissors into small pieces.

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3) Preparation of resins

C. Epoxy resin

Epoxy resin is normally used for binding any two products and coating the products. For that coating we wants add a hardener of the ratio 2:1 (epoxy resin: hardener). Stirrer the solution for 3-5 minutes its changes to peal white colour, at the time stop to stirrer it.

Fig. 2. Epoxy laminating resin and hardener

1) Coating over the fabric: Using of Epoxy resin

2) By manual method

Coat an epoxy solution on the fabric by using of stirrer and pore the waste jari on the fabric, kept it for 15 minutes in room temperature. Jari was tightly coated on the fabric.

Fig. 3. Epoxy resin sample by hand method

3) By padding method

Padding a bleached and sized fabric with epoxy resin, after padding pore the waste jari on both the sample. Once again pad those samples, and kept it for 1 hour in room temperature.

Fig. 4. Epoxy resin sample by padding method of sized fabric

Fig. 5. Epoxy resin sample by padding method of bleached fabric

4) Stiffness Test

Stiffness is the quality of the fabric being firm and difficult to bend or move. To determine the stiffness of the fabric cantilever principle is used. A form of the cantilever stiffness test can be carried out to measure the stiffness of the fabric. The stiffness tester consists of a polished smooth metallic surface. Index lines are engraved on these side pieces inclined at an angle of 41.5o below the plane of the platform surface. The test fabric is cut to a particular dimension of 200 mm length and 25 mm width. Use the template for cutting the fabric. Then the fabric along with the template is kept over the smooth metallic surface. Both the template and the fabric are pushed slowly. The fabric strip will start to drop over the edge of the platform due to its own weight. Continue the movement till the fabric viewed in the mirror cuts both index lines. Note the reading in the template against the zero-line engraved on the side of the platform.

Fig. 6. Stiffness tester

5) Fabric Tensile strength Test

Tensile strength tester is done to know about the fabric strength and the elongation of the fabric specimen. Strips of the fabric of standard dimensions of 150 mm x 50 mm are cut or you can use the template which will be available at testing labs. The test samples are fixed between the two clamps and are made to elongate at a constant rate. This is made possible with the bottom clamp that moves downwards as the screw rod rotates at constant revolutions per minute. As the extension of the test sample continues, the tension in the sample reaches a maximum and then breaks. The tension developed in the sample equally traverses to the upper clamp and thus deflects the load cell attached to it. This deflection alters the resistance offered by the strain gauge and as a result alters the voltage proportionally which is quantified as the breaking force.

Fig. 7. Tensile strength tester

6) Thickness test

The thickness of the fabric is measured by the thickness tester which consist if an anvil and a pressure foot. The standard for this test is ASTM D572 1997. The fabric is placed between the

pressure foot and the anvil at different 23 places of the fabric and the reading is notes. The average of these readings gives the thickness of the fabric.

Fig. 8. Thickness gauge

7) Light fastness

The resistance of dyed or printed materials to fading or colour changing due to exposure sunlight. The standard for this test is ASTM D4303. This experiment of the specimen was kept it for 4 hours continuously.

Fig. 9. Light fastness tester

3. Result and Discussion

1) Assessment of stiffness

The stiffness of the fabric sample before and after treating with an epoxy resin was tested based on the standard ASTM D1388-18. The fabric results are given below.

Table 1
Assessment of stiffness

S.no	Untreated Fabric (cm)	Hand method treated fabric (cm)	Bleached fabric by padding method treated fabric (cm)	Sized fabric by padding method treated fabric (cm)
1	2.6	3.5	3.1	3.3
2	2.7	3.4	3.2	3.2
3	2.5	3.6	3.0	3.3
4	2.6	3.5	3.3	3.4
5	2.5	3.6	3.1	3.3
Mean	2.58	3.52	3.14	3.3

The test results show that there is change in the stiffness of the fabric before and after epoxy finish. This indicates that the epoxy finishing was influence the stiffness of the fabric.

2) Assessment of tensile strength

The tensile strength of the sample fabric before and after treating with the epoxy resin was tested based on the standard ASTM D638. The fabric test results are given below. The test results show that the tensile strength of the fabric there is small changes in the epoxy samples. This indicates that the epoxy finishing was influence the tensile strength of the fabric.

Table 2
Assessment of tensile strength

S.no	Untreated Fabric (kgf)	Hand method treated fabric (kgf)	Bleached fabric by padding method treated fabric (kgf)	Sized fabric by padding method treated fabric (kgf)
1	16.56	17.66	17.33	17.50
2	16.30	17.15	17.20	17.35
3	16.45	17.20	17.23	17.21
4	15.80	16.80	16.75	16.77
5	14.98	16.25	16.20	16.30
Mean	16.018	17.012	16.942	17.026

3) Assessment of thickness

The thickness of the sample fabric before and after treating with epoxy resin was tested based on the standard ASTM D572-1997. The fabric test result was given below.

Table 3
Assessment of thickness

S.no	Untreated Fabric (mm)	Hand method treated fabric (mm)	Bleached fabric by padding method treated fabric (mm)	Sized fabric by padding method treated fabric (mm)
1	0.28	0.33	0.29	0.29
2	0.26	0.32	0.27	0.27
3	0.27	0.34	0.28	0.28
4	0.28	0.33	0.29	0.28
5	0.29	0.33	0.30	0.30
Mean	0.276	0.33	0.286	0.284

4) Assessment of thickness

The light fastness of the sample fabric before and after treating with light fastness was test based on the standard ASTM D4303. Comparing of two samples before treating sample fading lightly but after treating of epoxy sample was not fade.

4. Conclusion

In this study, the epoxy resin was treated on the fabric by waste jari for decorative purpose and technical composites. An epoxy resin was selected for high adhesive and best coated product. In those selected resin, epoxy resin only suitable for our product. The treated fabrics are assessment with some physical properties and the results are discussed. We use this product in technical textile composites.

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