

BIODEGREDALE IDENTITY CARD USING BAMBOO YARN

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ABSTRACT

This project presents an innovative approach to ID card rope manufacturing by leveraging bamboo yarn and a twist tape webbing machine. Bamboo, renowned for its strength and sustainability, serves as the primary material for crafting durable ID card ropes. The twist tape webbing machine facilitates the weaving and twisting of bamboo yarn, ensuring uniformity and strength in the final product. Through this project endeavours to offer a sustainable solution to the production of ID card ropes. Furthermore, the adoption of bamboo yarn contributes to reducing the industry's reliance on conventional synthetic fibres, they are minimizing environmental impact and promoting a greener approach to textile manufacturing. Through innovation and eco-consciousness, this project aims to pave the way for a more sustainable future in the textile industry while meeting the functional requirements of ID card rope production.

Keywords: Bamboo yarn, eco-friendly, ID card production, lanyard

INTRODUCTION

In recent years, the global textile industry has witnessed a paradigm shift towards sustainable and environmentally conscious practices. In line with this trend, this project explores a novel approach to ID card rope manufacturing, utilizing bamboo yarn and a twist tape webbing machine. Bamboo, hailed for its strength, durability, and eco-friendly attributes, emerges as a promising alternative to traditional synthetic fibres in textile production. The integration of bamboo yarn into the manufacturing process not only offers superior strength and longevity but also aligns with the growing demand for sustainable materials in consumer goods. Coupled with the precision and efficiency of a twist tape webbing machine, this project aims to revolutionize the production of ID card ropes by offering a greener, more sustainable solution. Through this introduction of bamboo yarn and advanced machinery, the project seeks to address both the functional requirements of ID card rope manufacturing and the imperative for environmentally responsible practices in the textile industry.

MATERIALS AND METHODS

Materials

1. Bamboo yarn (30 count): This will serve as the primary material for weaving the webbing.
2. Tape webbing machine: Used to weave the bamboo yarn into a webbing.
3. Printing machine: Used to print designs and information onto the webbing.
4. Tensile strength testing equipment: Used to measure the webbing's ability to withstand tension.
5. Colour fastness testing equipment: Used to assess the colour fastness of the printing.
6. pH testing kit: Used to determine the acidity or alkalinity of the finished ID cards.

These materials are essential for the successful production of ID cards made from bamboo yarn using a tape webbing machine. Each material plays a crucial role in ensuring the quality and durability of the final product.

Methodology

To make ID cards using bamboo yarn (30 count) for a tape webbing machine, the first step is to prepare the yarn by winding it onto the bobbins of the machine. The yarn can then be woven into a webbing, which will serve as the base material for the ID cards. The design and information for the cards can be printed onto the webbing using a printing machine. After the printing process, the webbing is subjected to a physical test to measure its tensile strength. This test assesses the webbing's ability to withstand tension without breaking. Additionally, a chemical test is conducted to determine the colour fastness of the printing. This test ensures that the colours on the ID cards will not fade or bleed over time. Finally, a pH test is performed to evaluate the acidity or alkalinity of the finished ID cards. This test is crucial as it can affect the durability and longevity

of the cards. By following these steps and tests, the quality and durability of the ID cards made from bamboo yarn can be ensured.

RESULTS

Main source



Bamboo yarn

Process 1



Tape webbing machine

Process 1 – result



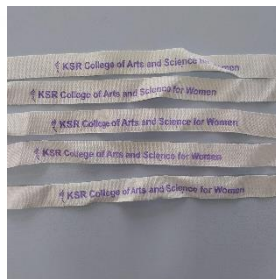
Bamboo Tape

Process 2



Screen printing machine

Process 2 – result



After screen printing

Final result



Finished product

PHYSICAL TEST RESULTS: Tensile strength

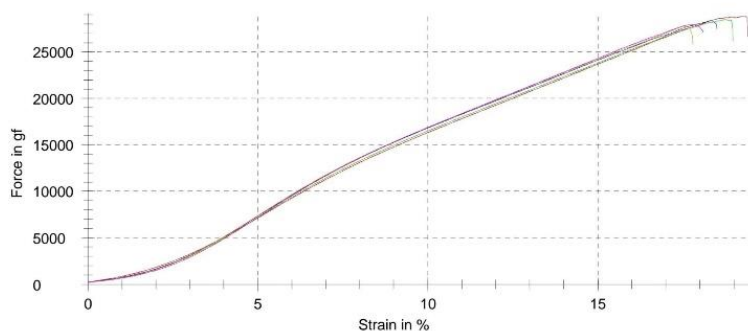
Test report

Job no. : C2301182-1
 Tester : SK
 Notes : SAMPLE ID-BAMBOO
 Pre-load : 2 N
 Test speed : 100 mm/min

Test results:

No.	F _{max} gf	dL at F _{max} %
1	28900	19.3
2	28500	18.8
3	28400	18.3
4	27700	17.6
5	27900	17.8

Series graph:



Statistics:

Series	F _{max} gf	dL at F _{max} %
n = 5		
x	28300	18.4
s	454	0.7
V [%]	1.60	3.79

CHEMICAL TEST RESULT: Colour fastness & pH

pH Value.. <i>ISO 3071 : 2020</i>	N2306857-1 Sample Particulars as given by Customer : ID Card Rope - (Bamboo)
pH value	6.91
The pH of extracting solution	6.17
The Temperature of the extracting solution, °C	24.8
Colour Fastness to Washing : Test 3 <i>IS / ISO 105 - C10:2006 (RA 2021) C(3)</i>	N2306857-1 Sample Particulars as given by Customer : ID Card Rope - (Bamboo)
Change in colour	4
Staining on	.
Viscose	4-5
Acrylic	4-5
Polyester	4-5
Nylon	4-5
Cotton	4-5
Tri Acetate	4-5
<i>Grey Scale Rating :- Change in Colour: 5-No change, 4-Slightly changed, 3-Noticeably changed, 2 - Considerably changed, 1 - Much changed Staining: 5-No staining, 4-Slightly stained, 3-Noticeably stained, 2 - Considerably stained, 1 - Much stained.</i>	
<i>- End of Report -</i>	

After conducting chemical tests for colour fastness and pH, as well as physical tests for tensile strength, the results have proven to be favourable and indicating the ID card ropes' durability and reliability. Customers can be confident in the product's ability to maintain colour vibrancy, pH stability, and withstand daily use effectively.

DISCUSSION

In this study, we have demonstrated the feasibility and potential of utilizing bamboo yarn in the production of ID card lanyards as a sustainable alternative to conventional materials. The manufacturing process outlined, involving tape webbing machines and screen printing, offers a streamlined approach that ensures efficiency without sacrificing product quality. Through rigorous chemical testing, including pH and colour fastness tests, we have confirmed the safety and durability of the lanyards, addressing concerns regarding skin contact and long-term use. Additionally, the results of the physical strength tests highlight the

robustness of the lanyards, validating their suitability for everyday use. Overall, this research underscores the importance of integrating sustainable practices into textile manufacturing while maintaining high standards of performance and functionality. By adopting such approaches, manufacturers can meet the growing demand for eco-friendly products while contributing to the preservation of the environment and the well-being of consumers.

SUMMARY AND CONCLUSION

In this project, we successfully created ID cards using bamboo yarn for a tape webbing machine. The ID cards underwent physical testing for tensile strength, chemical testing for colour fastness in printing, and pH testing. The results of the tests indicated that the ID cards made from bamboo yarn met the required standards for strength, colour fastness, and pH levels. The use of bamboo yarn as a material for ID cards proved to be effective and durable, making it a sustainable and eco-friendly option for future production. The successful completion of this project demonstrates the feasibility and effectiveness of using bamboo yarn for ID card production in a tape webbing machine. The physical testing results showed that the ID cards had sufficient tensile strength, while the chemical testing confirmed good colour fastness in printing. Additionally, the pH testing ensured that the ID cards were safe for use. Overall, the use of bamboo yarn for ID card production offers a sustainable and environmentally friendly alternative to traditional materials. Further research and development in this area could lead to wider adoption of bamboo yarn in various applications, contributing to a more sustainable and eco-conscious future.

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