INNOVATIVE DESIGN APPROACHES: EXPLORING THE POTENTIAL OF LATEX IN CREATIVE MATERIAL PRODUCTION

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ABSTRACT
The design of creative products from latex under the concept of BCG is a qualitative research. which focuses on studying the process of applying latex for product design By integrating the concepts between BCG Economy and Creative Economy by experimenting to improve the properties of rubber. and find the process of forming to get a product The research found that When the rubber latex was mixed with Sulfur (rubber stabilizer), wingstay L (anti-deterioration), xing oxide (activator), SSF (accelerator) and color. Mixed in proportion and molded in a mold. can make rubber qualified for forming in the form Forming in various formats Sheet or 3D format This is a process that can be used to create a type of product. rubber chair furniture This product can be a model for applying latex to create a product that responds to the needs of consumers. and in line with economic development policies along with social development and environmental preservation in balance to achieve stability and sustainability at the same time By changing the advantages that Thailand has from biodiversity and culture. to be able to compete with compete globally The distribution of income into the community. Reduce inequality strong community It is environmentally friendly and sustainable development.
Keywords: Creative Products, Para Rubber, BCG

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INTRODUCTION

Natural rubber (NR) is a type of natural polymer material, mainly obtained from rubber trees (Hevea brasilensis). Natural latex consists of two parts: dry rubber content about 25–40% by weight and non-rubber content about 5–10% by weight. The chemical formula is C5H8, and the molecular arrangement is cis-1,4-polyisoprene. (Department of Science Service, 2023)
Rubber is a kind of natural material. with unique properties that can be used widely in the present The most outstanding feature of rubber is its flexibility. It also has many good properties such as insulating or electrical properties. Shock absorption, etc., especially latex (Latex), which is a product of the food vascular tube in the bark of the rubber tree. Can be used as a raw material for making various types of rubber products. for industrial use Since heavy industries such as tire production to household appliances Para rubber is a plant that is more than 20 years old and has more than 12.3 million rai of planted areas throughout the country, scattered in every province. Especially in the southern region, rubber is a substitute for forests that have decreased. and to increase the green area of the country to be more from the increasing number of rubber plantations currently Causing the amount of rubber production to oversupply in the market As a result, the selling price is low. It is essential to bring scientific knowledge technology and innovation to add value (Thailand Institute of Scientific and Technological Research, 2023) to create innovation and create added value Creative product development with the concept of BCG Economy is another way to help create added value. which is not only promoting the economy alone but also a holistic economic development To develop a 3-dimensional economy at the same time, namely the bioeconomy (Bioeconomy) that focuses on using biological resources to create added value. By emphasizing the development of high-value products linked to the circular economy, taking into account the reuse of various materials as much as possible, and both of these economies are under the green economy (Green Economy), which is an economic development that not only focusing on economic development But it must be developed in parallel with social development and environmental preservation in a balanced way. to achieve stability and sustainability at the same time By changing the advantages that Thailand has from biodiversity and culture. to be able to compete with compete globally The distribution of income into the community. reduce inequality strong community It is environmentally friendly and sustainable development. (National Science and Technology Development Agency, 2023) Therefore, designing creative products from latex using the concept of BCG Economy combined with the knowledge base of the creative economy. linked to intellectual capital cultural capital and biodiversity will be able to create innovations that can meet the needs of today's consumer groups that pays attention to the environment Including development to export these goods and services. through the product uniquely creative It will also result in income distribution. strengthen the community which can reduce disparity It is environmentally friendly, affecting sustainable development.
This research aims to find out the process of designing creative products from latex using the BCG economy concept.

RESEARCH METHODOLOGY

The design of creative products from latex under the concept of BCG is a qualitative research. which focuses on studying the process of applying latex to the design of products with a process and the research methodology as follows:
1. Perform tests to enhance the latex's quality.
1.1 Finding the ideal proportions and ingredients can help improve rubber's quality as a material in product design.
1.2 Testing rubber that has undergone quality improvement for strength, tensile strength, and elongation at break

2. Developing procedures and techniques for producing latex
2.1 Selecting the best rubber molding technique for a product design
2.2 Testing different product prototypes to inform design
3. Design and development of products
3.1 Create and draft a design in accordance with the created rubber's qualities and molding procedure.
3.2 Create a model to verify the product's dimensions, ratios, and volume computation.
3.3 Product prototypes

RESEARCH RESULTS

The results from the experiment to improve the quality of latex by adding additives to obtain suitable materials for design into products by combining latex with sulfur (making the rubber stable), wingstay. L (anti-deterioration), Zing Oxide (activator), SSF (accelerator) and color, which the addition of such substances can make latex qualified. The strength of 50+ shore A, the tensile strength of 6MPa, and the elongation of 350% at break are the optimum values. Appropriate processes to be used to create products Including forming a molded sheet that can create patterns and colors. with the following steps: (Procedure for making sheets).

Step 1. The process of preparing concentrated latex and mixing paints

Figure 1 The process of preparing concentrated latex and mixing paints

Step 2. Prepare chemical stirring mixture according to the proportion. with sulfur (rubber stabilizer), wingstay L (anti-deterioration), xing oxide (activator), SSF (accelerator) Then bake at 100 degrees for 60 minutes.

Figure 2 Preparation of ingredients

Step 3. Remove the piece from the oven and bake or dry the rubber until all the moisture in the rubber is gone. and then bring the workpiece to be trimmed.

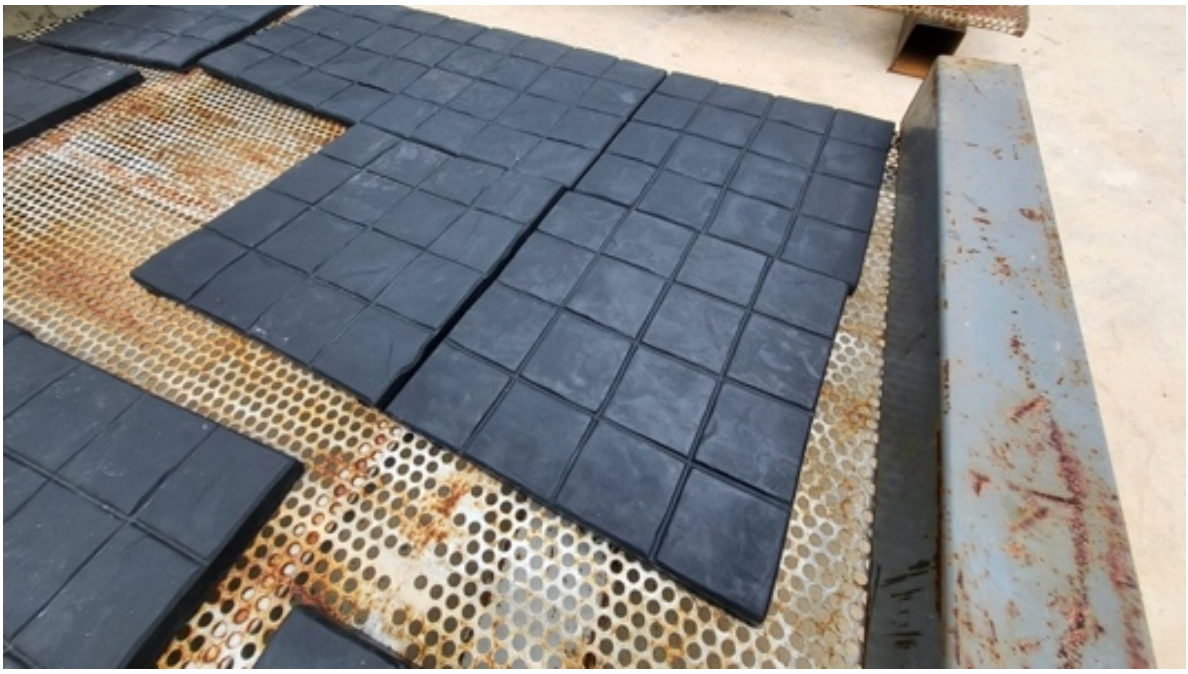

Figure 3 Baking and shaping

product design and development
design ideas
The study of the properties of para rubber, flexibility, was used as a creative material from para rubber. to develop into creative materials and adding value and innovative design of new materials

design process

from the experiment to the properties of rubber Flexibility Analyze the characteristics of the material as Issues in shape design in the hole of the rubber sheet and then be molded into nine rubber products

prototyping process

Step 1. Latex and mold preparation by using materials with smooth surfaces Which has chosen to use plaswood material as a structure and cover the patterned surface installed inside the mold to make the workpiece come out Have the desired texture.

Figure 4 Preparation of latex and mold

Step 2. Process of water and chemical preparation

Concentrated latex 60% volume
Black 2.5 CC.
Chemistry Set 1 Sulfur (stabilizes rubber), Wingstay L (prevents deterioration)
Chemistry Series 2 Oxides (activators),
Chemistry Set 3 SSF(Accelerator)
Pictures show

Figure 5 Process of water and chemical preparation

Step 3. Casting work pieces and baking with steam process ready to form.

Figure 6 Product molding

complete product picture

Figure 7 Prototype

DISCUSSION & CONCLUSION

Latex creation products with the BCG concept are designed to create new materials and innovative production processes. by designing products from rubber Use the properties of rubber in terms of flexibility. And it is also a value added to the latex.

The research findings have shed light on latex's potential as a creative material, especially in the context of lifestyle product design. The results of the trials indicate how versatile latex is and highlight its special qualities, including flexibility, toughness, and water resistance.

Experiments to improve the quality of latex to increase its properties suitable for use in product design should highlight the outstanding properties of latex, such as elasticity, softness, retention, strength, and tensile strength. In addition, the process of production should be simple. It is not complicated for ease of production and is suitable for the community. in keeping with the data exploration and analytical findings of Kasephet (2008). Community-level guidelines for the development of latex-based goods specify that manufacturing should be simple. Utilizing a combination of latex formulation and stitching with other appropriate materials, conventional manufacturing techniques are applied in conjunction with rubber science and technology procedures to reduce production costs. and in line with Seo (2018), who concluded in the research Creative Rubber product designs with delayed-action gelling agent Innovation for Value-Added of Eastern Rubber that rubber materials in a new creative way. It can be an alternative to adding value to rubber in the East. Thailand Interesting products include residential decoration products, fashion products, etc.

In conclusion, our study has shown that latex has enormous potential as a creative medium. The design of inventive items must, however, carefully take into account the characteristics of the material and the production method. The results of this study offer a useful framework for further investigation and advancement in the area of innovative latex product design, particularly in Thailand, the world's largest natural rubber producer.

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