LATEX BAG DESIGN WITH CREATIVE ECONOMY CONCEPT

Sittichai Pintuma*, Wariya Ketchu**

*,**Faculty of Fine and Applied Arts, Suan Sunandha Rajabhat University, Bangkok, Thailand

E-mail: *Sittichai.pi@ssru.ac.th, **s58126608046@ssru.ac.th

ABSTRACT

The objectives of this research were **1)** to study the properties of liquid latex rubber and molding techniques for product design; **2)** to experiment with liquid latex rubber molding; and **3)** to design bags from liquid latex rubber. Use qualitative research processes. It starts with studying information about the properties of liquid latex rubber and its formation by studying various sources such as books, theses, research articles, journals, magazines, and online media. It is analyzed and experimented with to create design guidelines and develop until it is a complete prototype.

The properties of liquid latex rubber that are suitable for use in bag design include: high elasticity properties; this makes it possible to protect the contents inside with the elasticity of the tire. By sticking together, liquid latex rubber can be used as a bond instead of sewing. Tensile strength and tear resistance High impact resistance and abrasion resistance will help make the resulting bag strong. Resistance to weak acids and alkalis will help protect items from chemicals.

From the experiment with liquid latex rubber and molding, it was found that liquid latex rubber can set more quickly by using vinegar (acetic acid), an artificial vinegar type, which can create patterns using two techniques: drip and tracing. It has a tensile strength of 0.5 N/square mm. 709% ruffocity, tear strength of 2.2 N/mm, and tracing technique It has a tensile strength of 1.1 N/square millimeter. 936% ruffocity and tear strength: 3.3 N/mm

Keywords: Bag, Liquid latex rubber, Creative Economy

INTRODUCTION

At present, bags are an essential and important product for humans to store important items for use when traveling to various places. In addition, the bag is like another piece of jewelry (Chomchan Daoduean, 2015). When choosing a bag, you can consider its shape, color, and usage pattern. Materials are an important part of buying a bag because the properties of the materials used must be strong, flexible, and impact-resistant in order to protect the contents inside the bag. There are many forms of materials used in production, and nowadays consumers tend to pay attention to materials derived from nature. Because, in addition to being beautiful, it is also an environmentally friendly product.

Liquid latex rubber is a natural material with many unique properties, allowing it to be used for a wide range of purposes today. The most notable feature of rubber is its elasticity. In addition, it has many good properties, such as thermal or electrical conductivity, shock absorption, etc. Liquid latex rubber can be used in many different ways, including primary processing from fresh liquid latex rubber. As raw materials for the industry, various rubber products can be divided into two main types: dry rubber and thick rubber (Waraporn Kajonchaikul, 2009). Thailand is a country that processes very little of these rubber products, despite being one of the world's top rubber growers for a long time. Instead, they use Thai rubber to produce products and send them back to sell in Thailand. As a result, Thailand has lost the opportunity to make money for the country (Southern Alternative Agriculture

Network, 2008). Therefore, policies have been planned to solve the liquid latex rubber problem by using innovation and modern technology to process rubber into products in order to modernize and meet the needs of consumers.

The creative economy is a way to create added value for products that is based on the basic principle of value creation using knowledge and innovation. Combined with strengths in the diversity of natural resources It is another way to facilitate the creation of businesses with creativity (Kanin Paivanrat, 2020).

Based on this information, the idea was to add value to liquid latex rubber. The creative economy is the use of knowledge and creativity. The idea is to create new techniques to add value and further develop the use of liquid latex rubber, which is a very popular crop grown in Thailand. But there is still little processing of these liquid latex rubber products due to the properties of liquid latex rubber, such as flexibility, thermal or electrical insulation, and shock absorption. There are also several features that are perfect for making bags that are used to store and protect important items used in everyday life.

OJECTIVES

1. To study the properties of liquid latex rubber and molding techniques for use in product design.

2. To experiment with liquid latex rubber molding for use in bag design.

3. To design bags from liquid latex rubber.

METHODOLOGY

Step 1: Study information about the properties of liquid latex rubber and forming by studying various sources such as books, theses, research articles, journals, magazines, online media.

Step 2: Experiment with the liquid latex rubber molding process for use in bag design.

Step 3: Design and Development

1. Design concept summary
2. Sketch and develop designs
3. Drawing for production
4. Manufacture prototypes

RESULT

Analysis of the properties of liquid latex rubber that is suitable for making bags includes:

Table 1: Liquid latex rubber properties suitable for making bags

Features of Liquid Latex Rubber	It is appropriate to make bags	It is not appropriate to make bags
Temperature adaptation	✓	
high electrical dielectric strength	✓	
High elasticity	✓	
Stickiness sticks together	✓	
Tensile strength	✓	
Tear resistance	✓	
High impact strength	✓	
high abrasion resistance;	✓	
Resistant to acid and weak alkali	✓	

Features of Liquid Latex Rubber	It is appropriate to make bags	It is not appropriate to make bags
Sensitive to oxygen interactions Not resistant to ozone		✓
High bounce		✓
Operating temperature from -55 to 70 degrees Celsius	✓	

From Table 1, it can be concluded that the properties of liquid latex rubber suitable for processing into bags include: temperature adaptability; high elasticity; Stickiness, tensile strength, and tear resistance High impact strength and high abrasion resistance. Resistant to acid and weak alkali

Table 2: Classification of substances used in liquid latex rubber processing

Substance type	Substance Name	chemicals	Natural substances
Conditioning agent: liquid latex rubber	Potassium hydroxite	✓	
	ammonia	✓	
Liquid latex rubber binder	Formic acid	✓	
	Acetic acid		✓
	Sulfuric acid	✓	
Stabilizers	Potassium Oleate	✓	
	Ammonium Laurate Sulfate	✓	
	Sulfonate of organic matter KCENE Ammonium Caseinate	✓	
Liquid latex rubber stabilizer	sulphur	✓	✓
	Sync Oxide	✓	
	Ditite Ocabanate	✓	
	Zantate	✓	
	Thiazole	✓	
	Litopone	✓	
	White lead	✓	
	Black soot	✓	✓
	Mineral oil	✓	
Anti-rubber agent	Nonox WSL	✓	

Table 2 reveals that different substances are used to process and optimize liquid latex rubber. An interesting substance in this research is the substance that helps liquid latex rubber, acetic acid, also known as vinegar, which is an important aid in the production of dry rubber. Rubber Sheet: In order to make liquid latex rubber bind, it has no negative effect on the quality of the resulting rubber. Also, it is not a dangerous acid because it is a weak acid.

Processing Experiment of liquid Latex Rubber

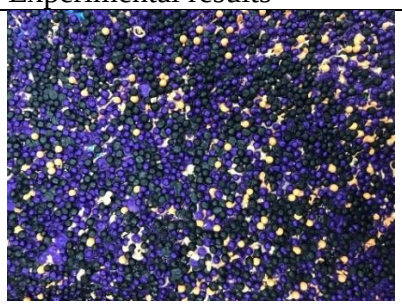
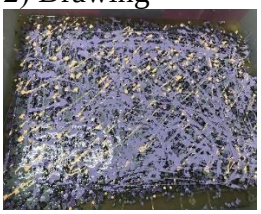
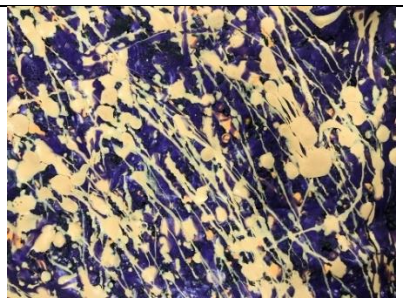
Experiments on the type of vinegar (acetic acid) that has the effect of binding liquid latex rubber, which is a weak acid derived from nature and has no negative effect on rubber quality. There are 3 types: fermented vinegar; Distilled vinegar and artificial vinegar, the results of which are shown in Table 3

Table 3: Vinegar type experiment with liquid latex rubber binding effect

Experimental method	Experimental results	advantage	weakness
1) fermented vinegar 		1. Make liquid latex rubber set	1. Strong smell 2. Make tires yellow
2) distilled vinegar 		1. Make liquid latex rubber set	1. Strong smell
3) artificial vinegar 		1. Make the liquid latex rubber set. 2. Faster set 3. Low smell	

From the experiment It was found that vinegar All kinds of tires can be made to bind, which differs in smell. Artificial vinegar will have the least odor and will keep the rubber from yellowing

Table 4: Experimenting with the use of liquid Latex Rubber in creating patterns.

How to create a pattern	Experimental results	advantage	weakness
1) Dripping 		1. Get a strange pattern 2. Easy to do 3. Can control the pattern	1. Long time consuming
2) Drawing 		1. Get custom patterns	1. The process is complicated and requires patterning skills
3) Tracing 		1. Get the pattern according to the template surface. 2. Easy to do	1. Long time use

From the table, it was found that creating suitable patterns such as dripping and tracing is a simple process that can be done easily

Table 5: Test results of liquid Latex Rubber properties from drip technique and tracing technique

Patterning techniques	Dripping	Tracing
Tensile strength[1] (Newton/mm²)	0.5	1.1
Stretch when broken[1] (percent)	709	936
Tear strength resistance[1] (Newton/mm)	2.2	3.3

Design ideas

The form of the product will be an imitation of nature using tracing techniques and creating a dripping surface. It represents the camouflage of plants and animals in the ecosystem.

Figure 1. Moodboard

The design process is divided into 2 techniques: drip technique and tracing technique

Figure 2. Shows dripping techniques to create textures

Figure 3. Show me tracing techniques

Figure 4. Prototype Products

CONCLUSIONS AND DISCUSSIONS

The purpose of designing bags from liquid latex rubber is to study the properties of liquid latex rubber when creating bags.

The properties of liquid latex rubber are suitable for use in bag design. high elasticity properties. This makes it possible to protect the contents inside with the elasticity of the tire. This makes it possible to use liquid latex rubber as a bond instead of sewing. Tensile strength and tear resistance High impact resistance and abrasion resistance will help make the resulting bag strong. Resistance to weak acids and alkalis will help protect items from chemicals.

From the material experiment and molding of liquid latex rubber, it was found that the rubber can set more quickly by using vinegar (acetic acid), an artificial vinegar type, which can create patterns using two techniques: drip and decalcing. It has a tensile strength of 0.5 N/square mm. 709% ruffocity, tear strength of 2.2 N/mm, and tracing technique It has a tensile strength of 1.1 N/square millimeter. 936% ruffocity and tear strength: 3.3 N/mm

ACKNOWLEDGEMENTS

I would like to express my sincere thanks to Suan Sunandha Rajabhat University for invaluable help throughout this research.

REFERENCES

Chomchan Daoduean. (2558). **Development and design of women's bags from Ban Pha Tang antique woven fabric Uthai Thani.** Bangkok : Naresuan University.

Khanin Phriwanrat. (2020). The research and development of tie-dyed handicraft products form Krabi Province for the designing of Ko Klang Community's contemporary souvenirs, leading Krabi Province to Creative city. Journal: Humanities, Arts and Social Sciences Studies, (20)1, 119-137, Dec 2018.

Southern Alternative Agriculture Network. (2551) **Gardener experience Alternative rubber**. Bangkok: Thana Printing Limited Partnership

Waraphon Khachonchaikun. (2552). **Rubber Products : Manufacturing & Technology.** Bangkok: Sino Publishing (Thailand) Co., Ltd