PALM-BASED BATIK WAX

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678

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In general, it is well-known that vegetable-based waxes have many industrial applications and environmental benefits against petroleum-based wax. One of the many examples is in the production of candles. However, there are other areas where vegetable-based waxes can play a significant role. One of which is in the making of batik prints or designs.

Batik printing is a process of decorating plain fabrics by covering a part of the material with a layer of wax and then dyeing the whole fabrics. The waxed areas would maintain their original colour because they are not dyed. When the wax is removed, the contrast in colours between the dyed and undyed fabrics gives the desired patterns. The unique characteristic effects of this technique are contributed by the fine cracks that are present in the wax, which allow small amount of dyes to seep in, thus giving some spectacular ecstatic batik designs.

Batik wax exercises an important function in the process of batik printing. Proper usage of wax results in an impeccable batik works. A traditional recipe for batik wax is a mixture of beeswax and paraffin. But most of the batik today is painted using synthetic waxes.

In MPOB, batik wax formulations containing a large amount of palm-based materials have been developed. This palm-based batik wax performed equally well as the beeswax and paraffin batik wax. This is evident by the beautiful finished works of batik paintings as shown in *Figure 1*.

Figure 1. Batik fabrics painted using palm-based batik wax.

Figure 2. Palm-based batik wax.

PALM-BASED BATIK WAX

A formulated palm-based wax for batik and artworks is a glittering brownish product, and can be made into blocks (*Figure 2*). The palm-based wax is easy to handle and work with, due to its lower melting temperature compared to the traditional paraffin-beeswax mixtures. As a result, a lower heating temperature is required, and this poses low risks to the operators or painters from getting

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burnt due to the hot waxes. This also means that less time is required to remove the palm-based wax from the fabrics during de-waxing stage in the batik making process.

Moreover, palm-based wax products are formulated from a renewable resource, which is more environmental-friendly than paraffin wax mixtures. *Table 1* shows some of the features of batik wax produced from palm materials in comparison with commercial batik wax mixtures.

MARKET ANALYSIS

Kline & Company (2011) reported that global demand for waxes had reached 4.4 million tonnes in 2010, with mineral waxes accounted for 85% of global demand, followed by synthetic waxes (11%), and animal and vegetable waxes (4%). It was forecasted that the wax consumption is expected to grow at an average annual growth rate of more than 2% from 2010 to 2020. However, this growth rate is very much dependent on regions and different product applications, whereby on the demand side, waxes for various candle applications represent 46% of global wax consumption. Another market report from Parker (2011) indicated that the export and import values of vegetable waxes (excluding triglycerides) for Malaysian market in 2011 were around USD 3.656 million (2.93% of world market value) and USD 1.239 million (0.99% of world market value), respectively.

The batik industry in Malaysia has existed since 1921 (Wan Hashim, 1996). Throughout the years of its existence, the industry has contributed to the Malaysian economic well-being by creating jobs and business opportunities especially in rural areas. Batik products have, over the years, attracted tourists worldwide and hence, have supported the growth of Malaysian tourism industry (Leigh, 2002). There is a significant growth in the batik industry, where the recorded sales increased to RM 89 million in 2009 as compared to only RM 47 million in 2004. The number of batik entrepreneurs had also increased from 246 in 2004 to 604 entrepreneurs in 2009 (Bernama, 2010). However, the majority of them still use the traditional paraffin-beeswax mixtures in the batik making process. The retail price of a commercial batik wax generally range between RM 18 to RM 25 kg^{-1}.

ECONOMIC ANALYSIS

Palm-based batik wax offers an opportunity to interested parties that are eager to promote the green and environmental-friendly products into batik industry. The investment and payback period of the palm-based batik wax business is given below:

Capital investment = RM 64 000.
Operational cost = RM 173 000.
Production capacity = 14 400 t yr^{-1}
@ 50 kg per batch.
Payback period = four years.
Net present value (NPV) @ 10% = RM 80 000.
Internal rate of return (IRR) = 16%.
Cost price = RM 12 kg^{-1}

TABLE 1. PHYSICAL COMPARISON BETWEEN PALM-BASED BATIK WAX AND COMMERCIAL BATIK WAX

	Parameter	Description	
		Palm-based batik wax	Commercial batik wax
1.	Appearance	Solid	Solid
2.	Melting temperature	Below 70°C	70 °C – 80°C
3.	*Hardness (mm)	0.15 – 0.30	0.15 – 0.75
4.	Colour	Brownish	Yellowish – brownish

Note: * ASTM D217.

POTENTIAL TAKERS

- Batik manufacturers.
- Handicraft manufacturers.
- Artworks shops.

BENEFITS OF THE PRODUCT/TECHNOLOGY

- The batik wax contains more than 80% palm-based materials. This palm-based batik wax has similar performance to the commercial batik wax.
- In addition, the palm-based batik wax can be used for artworks especially in encaustic painting by providing a glittering type of textures to the arts.

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