Palm Oil Based Material for Use in UV Curing Coatings, Adhesives and Printing

**IN BRIEF**

Radiation curable coatings are the polymer coatings, which are cured (cross-linking) when exposed to a radiation of ultra violet light (UV) or electron beam (EB). Most of it is derived from synthetic raw materials. The researchers have developed an alternative material from palm oil that is green and sustainable for use in UV curable formulation applications such as adhesives, printing inks and surface coatings.

**PALM OIL BASED URETHANE**

With the intention to cater for UV curable formulation applications, the researchers have developed these new green and sustainable materials. This material offers an advantage for various applications for coating industries such as wood coatings, printing inks, and adhesives. The advantages of the material can be summarized as follows:-

- Renewable natural resources from palm oil
- Biodegradable (palm based)
- Environmental friendly and Non toxic
- Faster process and higher curing rate for UV/EB curable resin applications
- Can be locally produced

The potential applications are:-

- UV Printing Inks industry
- UV Overprint Varnishes (OPV)
- UV Adhesives for medical, home & automotive interiors applications (tapes etc)
- UV Surface Coatings on plastics, papers, and wood panels etc
- UV Pressure Sensitive Adhesives (PSA)

Most of these UV curable formulation components are commercially available and derived from synthetic raw materials. Only a few known acrylated oils are originated from natural raw materials. Furthermore, the available UV-curable components from natural raw materials have no better properties compared to the synthesized raw materials. Therefore, the researchers from local Research Institution have developed a process to produce this material based on natural products with similar or better properties than the commercially available UV-curable components.

**MARKET POTENTIAL**

With the continual escalation in the petroleum price, there has been an increase in the use of renewable feedstocks for industrial products. Palm oil and its products, being renewable and readily biodegradable, are the alternative feedstocks for the production of palm oil-based polyol for polyurethane products. As widely known, oil palm is one of the world’s most economical oil crops. For example, a tonne of its fresh fruit bunches (FFB) yields 200 kg crude palm oil and 40 kg palm kernels which, in turn, yield about 50% of their weight, or 20 kg, of palm kernel oil. A hectare of estate can yield 20-24 tonnes of FFB per year, which in turn will yield 4 to 5 tonnes of palm oil and 400-500 kg of palm kernel oil.

According to MPOB, in Malaysia, the total polyurethane consumption is estimated at more than 68 000 tonnes. The materials can be used for various types of polyurethane products such as panels, foams, cushion, automotive parts and as well as adhesives and coatings.

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