PALM OIL - BASED INK - A NEW DOWNSTREAM PRODUCT

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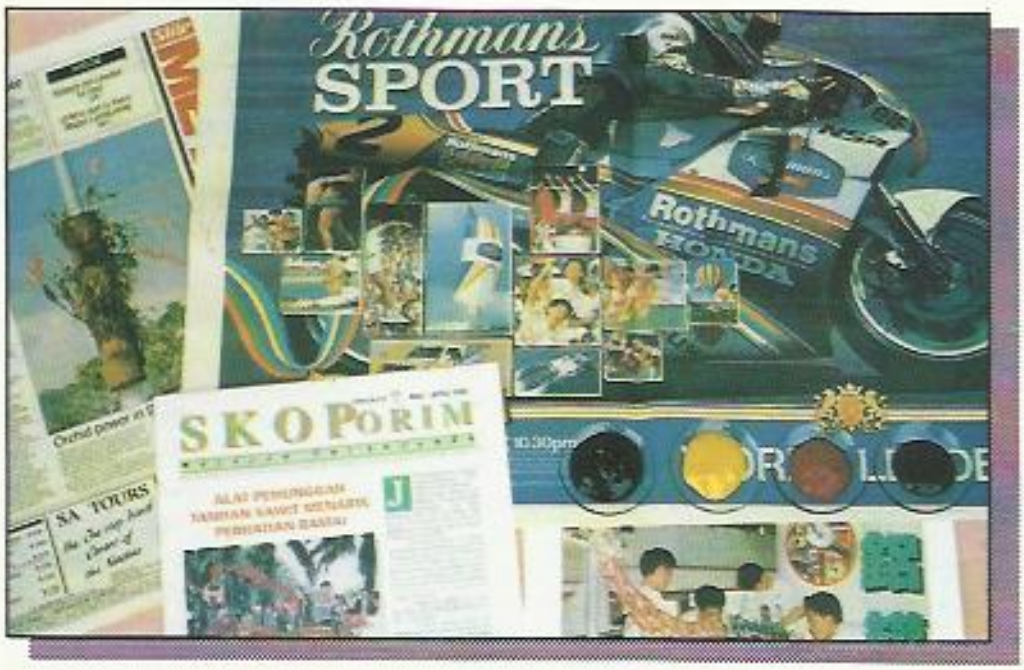

Palm oil-based printing ink is a recent innovation of a collaborative research project between Coates Brothers (M) Sdn Bhd and the Palm Oil Research Institute of Malaysia (PORIM). Begun in the middle of 1990, the project has gone through the usual stages of laboratory formulation and testing, through pilot plant production to final testing of the product at the user's end. The results have indicated that palm oil could be used in the manufacture of printing ink.

PRINTING INK

It is said that the invention of printing is crucial to the advancement of human civilization. Using a writing implement and ink, man put his impressions, ideas and thoughts into something endurable for posterity. The progress of civilization was slow until the manual transcription of records, books, manuscripts, *etc* was replaced by the printing process. Today at the output end of modern information technology there is still the print-out to give a visual and permanent record. Thus printing ink has facilitated human progress.

Over the years, printing ink has evolved from the traditional black to the hues of the rainbow. Coloured inks are used not only as a decorative tool to convey a message but also as a means to attract attention to it. Modern printing inks need to have versatile properties so that they can be applied to a wide variety of surfaces, whatever their texture, size or shape. Paper, plastic, metal, glass and textile will all accept ink but it falls on the skill of the ink maker to ensure that the right ink is available for application to a particular surface to give the best printing. Thus different types of ink have been developed for various processes and end uses.

PALM OIL INTO INK

Conventionally, ink is made from petroleum products. The basic materials of an ink consist of solvent, resin, pigments

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and other additives. The percentage composition and type of ingredients depend very much on the type of ink to be produced. The two petroleum crises in 1973 and 1979 stimulated research to find alternatives to mineral oil and other petroleum derivatives that are used in ink manufacture. In general, vegetable oils have been found to be suitable alternatives. In Malaysia, where there is an abundant supply of palm oil, it is natural that our collaborative research has focussed on palm oil. Right at the beginning, it was anticipated that palm oil being semi-solid in nature would present some difficult problems when directly used in the formulation of printing ink. However, through the coordinated research efforts of Coates Brothers (M) Sdn Bhd and PORIM most of the anticipated problems have been overcome and the first palm oil-based printing ink is the result.

PERFORMANCE TRIALS

In laboratory studies, comparative performance trials of palm oil based inks and conventional petroleum based ink have shown that palm oil based inks are better in tack and print stability than petroleum-based ink (see table). Subsequently, tonne quantities of the palm oil - based ink for newspaper printing were prepared and successfully put through several continuous commercial runs at a newspaper publishing facility. Judging from the clearer and brighter physical appearance of the product printed with the palm oil-based ink, we are of the view that the quality of printing is comparable to, if not better, than that obtained with petroleum-based ink.

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Performance Comparison:
Petroleum-based ink vs Palm Oil-based ink
(Laboratory studies)

	Petroleum based	Palm Oil Based
Tack	std	std
Viscosity	std	std
Shade	std	std
Gloss	std	std
Tack; stability	std	superior
Rub resistance	std	std
Print stability	std	superior
Storage stability	std	std
Litho resistance	std	std

std: standard

ENVIRONMENTAL IMPACTS AND FUTURE PROSPECT

It is generally accepted that products derived from natural oils and fats are more readily biodegradable than the corresponding products made from petroleum and hence their impact on the environment is less. Palm oil-based printing ink may therefore be expected to be environmentally friendlier than petroleum-based ink. In fact, it was found that palm oil based-ink emits less volatile organic compounds than petroleum-based ink. It is therefore envisaged that its future use in newspaper printing will result in a healthier and more conducive working environment. Moreover, disposal of spent palm oil based printing ink would be easier because of its minimal environmental impact. Therefore, not only has a new use for palm oil been found but also the technical feasibility of producing an environmentally friendlier, safer and more economical printing ink from palm oil has been demonstrated in this collaborative research.

Printed with Palm Oil-Based ink by PORIM

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