

PALM-BASED CRAYON

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Crayons are most often used by children on various types of paper, such as notebook paper, art paper and posterboard. They are available in a wide collection of colours ranging from primary colours to fluorescent colours. They are formulated from combinations of waxes, colourants, colour extenders and other additives. *Figure 1* shows some of the commercial crayons available in the market. It was reported that on average, a child in America wears down 270 crayons by his or her 10th birthday.



Figure 1. Some commercial crayons available in the market.

In order to formulate good crayons, it is important to know what the consumers want. Generally, consumers desire crayons with improved properties such as:

- better laydown and better drawing qualities;
- less flaking from completed drawings using the crayons;
- better strength; and
- improved colour coverage, colour intensity, uniformity and smooth.

Laydown is a measure of the smoothness qualities with which the writing compositions transfer to the writing surface. Children prefer crayons having improved laydown since they can produce better drawings having richer and more brilliant colours with minimal exerting pressure on the crayon. Flaking or loose particles of crayon material can present a clean-up problem in the home when children use crayons

which flake, since the flakes can be ground into the working surface. All these depend on the composition of the materials. However, most crayons are made from paraffin wax, by-product from petroleum industry and may contain toxic compounds. An all natural, biodegradable crayon from palm oil has never been produced. Therefore, the objective of this project is to formulate an all natural, biodegradable and environmentally friendly crayons and in this case palm-based materials, renewable resources, are used.

This technology discloses formulated palm products suitable for making crayons which have smooth laydown characteristics when applied on the substrate particularly on papers which are substantially free from tackiness to touch, less flaking, good strength and eject easily from the moulds. Besides, they are more environmentally friendly and conform to EN 71-3 and ASTM - D 4236.



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