Paper B5

Critical mineral characteristics and their applications to the paint industry in the Asia region

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In general, industrial mineral deposits are often defined by the mineralogy, quantity and quality of what we perceive as suitable for the industry, without sufficient understanding of the final applications. But very often, it is the detailed requirements (specifications) of the end-user, other than the processing capabilities, the price and the logistics, which define whether a deposit is economically viable, and whether it can be used for certain applications or not, such as for the paint industry.

The paint industry is important because it is one of the industries where a large abundance of minerals are used, and where the specifications are normally quite stringent. This industry contributes a value of over US$ 450 million (from 150 million litres) to the Malaysian economy. It is therefore extremely important to focus on the particular requirements of this industry, so that we have a better guide to search for mineral deposits that can fulfill the requirements of this industry.

In the infancy of the paint industry, minerals are commonly used as cheap fillers to reduce the cost of a can of paint. However, in recent times, modern paint formulators can modify both the engineering and aesthetics of these paints or coatings, of which the mineral fillers (now referred to as extenders) are a part.

The extenders are now used as engineering tools, and they play diverse roles in the application and function of the modern coatings.

Some of the more important extenders or mineral groups used by the paint industry in Malaysia, and many countries in Asia, are calcium carbonate, barium sulfate, silica, and the silicates which include talc, clay, feldspar and mica.

However, many more mineral products need to be studied and researched, as the industry is getting better aware of their role in improving the paint properties, as well as in reducing costs by replacing the existing, highly expensive (but similar mineral materials), that are being imported from the US and the EU.

The critical mineral parameters that have to be considered, when formulating different types of paints for certain functions, are as shown below.

a) Physical & chemical characteristics of individual mineral or composites
b) Size of mineral grains achievable, based on grinding capabilities
c) Degree of weathering of the mineral product
d) Presence or absence of impurities in the mineral product; what types, quantity, in what form eg locked or free, and are the processes capable of separating the impurities from the mineral products.
e) Are the mineral products in compliance with environmental & safety regulations eg. are the mining operations sustainable, & is the source rehabilitated after mining.
f) Consistency of the products delivered from supplier (for every batch)

Some examples of the mineral properties that are critical to the paint industry are discussed.

From consideration of the above requirements, it may be necessary to further delineate various sub-zones within a mineral deposit for different applications to the paint industry.

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