



Technical Article

Introducing Geostatistics to the China Clay Industry

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E.C.C. Ltd. extracts clay matrix from primary kaolin sources in the South West of England, the properties of which are inherently variable. Quality control procedures during the stages of processing ensure that the final products meet market requirements. Bore hole samples are used to assess the geometry and overall properties of the deposits for planning pit development. In a changing market involving the use of advanced technology, new methods of quality control are continually being investigated. This paper discusses a series of experiments which have been carried out to examine the use of mathematical and statistical methods as applied to bore hole information with the object of supplementing existing knowledge of the variations within the deposit. These experiments have subsequently resulted in the widespread use of geostatistics within the Company.

English China Clays Ltd. (E.C.C.) is the largest producer of china clay in the United Kingdom. The industry is concentrated in the St. Austell area of Cornwall and there are also operating plants on Bodmin Moor and on Lee Moor in Devon (Fig. 1). E.C.C. also have operating companies in North and South America, Europe Japan and Australia and its deposits are not confined solely to china clay. For example, E.C.C. Ball Clays Ltd. which operates in Devon and Dorset are one of the most important producers of ball clay in Europe.

The traditional market for china clay is the ceramic industry where it is used in the production of bone china, earthenware, sanitaryware tiles and refractories but as Table 1 shows this represents a relatively small percentage of total sales.

The bulk of the material is sold to the paper industry either as a filler, where it is used to fill the interstices of the pulp fibres or as a surface coating, to produce a smooth, bright and usually glossy finish. Other industries using china clay include paint, rubber, plastics, pharmaceuticals, insecticides and fertilisers where the clay is used as an anti-caking agent.

In all E.C.C. produces approximately 30 different clay products, each one having its own quality specification such as particle size distribution, brightness, viscosity and chemistry: some ceramic clays can have over 10 separate quality specifications which must be adhered to.