BENEFICIATION OF INDUSTRIAL MINERALS BY AIR CLASSIFICATION

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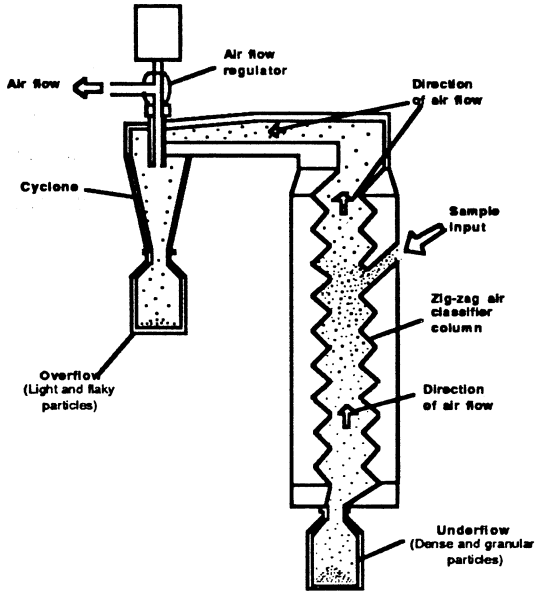
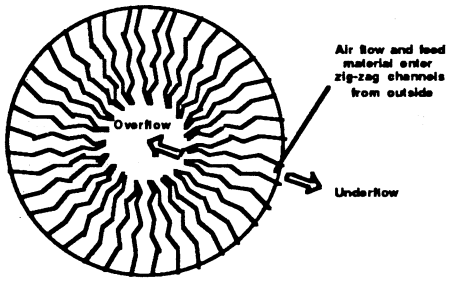
Many mineral prospects in developing countries occur in arid areas, and air classification can be particularly valuable in the dry treatment of these resources. Through the ODA-funded R&D project *Minerals for Development* , BGS has been investigating the use of two types of air classifier for upgrading a range of industrial minerals: a gravity, or Zig-zag, classifier for treating feed material from 100 µm up to 6 mm, and a centrifugal classifier for treating finer size feeds below 250 µm. Three case histories will be described.

Graphite. Investigations have been carried out into the feasibility of producing high-quality flake graphite from a number of deposits in Africa. As many of these are remote from water, any pre-concentration that can be carried out on site has a large effect on the economics of the process. Laboratory studies using the gravity air classifier have shown that pre-concentrates running at 70% graphite could be produced on site, prior to final purification by froth flotation.



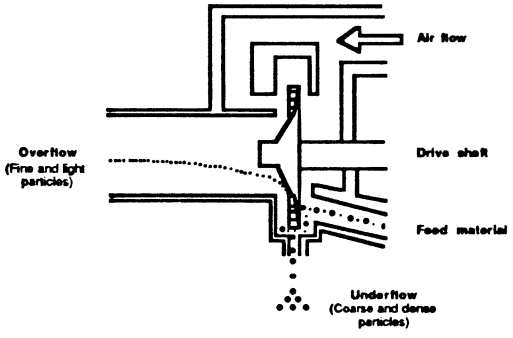
Zig-zag air classifier

Feldspar. Pegmatites in Thailand formerly worked for tin are now being considered as sources of feldspar to meet the increasing demand for ceramic raw materials in this country. In one of the deposits near the border with Burma, feldspar greater than 20 mm is being hand separated but this represents only about 30% of that potentially recoverable. Below this size mica becomes a significant impurity, imparting a poor colour to the fired material. Since production started in 1987, all feldspar-rich material below 3/4" has been stockpiled until a simple method of eliminating mica can be devised. A combination of close screening and gravity air classification has resulted in significant elimination of mica from this material down to a particle size of 0.5 mm.



Centrifugal air classifier classifying wheel

Diatomite. One of the major uses of diatomite is as a filter aid, for which closely sized products of low surface area and low bulk density are required. In the evaluation of a diatomite from Zimbabwe the raw material was dried, milled and flux-calcined. The calcined material was then air-classified to produce a range of products within the 5 - 40 µm size range and these compared favourably with commercially available filter aids.



Centrifugal air classifier