

### **The Effects of Pellet Size and Bentonite Content on Iron Ore Pellet Dustiness**

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#### **Abstract**

Handling bulk materials is inherently dusty and shipping and handling iron ore pellets is no exception. Dust generation, undesired for economical, health and environmental considerations, may depend on many factors such as: iron ore pellet size, which could influence pellet surface area; and microstructure, which is influenced by binders such as bentonite clay. To understand how these parameters affect pellet dustiness, iron ore pellets were made in the laboratory from an un-fluxed, magnetite concentrate. Pellets were made at industrially relevant sizes and bentonite doses, ranging from 6 - 16 mm in diameter, and from 0 – 8.9 kg/t, respectively. All pellets were fired at 1200 °C for 1 hr. Pellet dustiness ranged from 10 – 100 mg dust per kg pellets, similar to levels observed in industry-made pellets. Under these firing conditions, pellet dustiness decreased independently with increasing bentonite dose and increasing pellet diameter. An approximately 1:1 correspondence between change in surface area and change in pellet dustiness was observed during these trials.