

### **Magnetic Field Enhanced Filtration of Concentrated Hematite Ore**

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#### **Abstract**

The introduction of a magnetic field to a filter cake during filtration of concentrated hematite ore has shown to improve filtration rates by as much as 56%. The filtration rate of concentrated hematite ore slurries is strongly affected by the structure of the filter cake. Fine hematite ore particles exhibit weak ferromagnetic susceptibility at temperatures above 250 K (Morin transition temperature) (Pastrana et al. 1978). In an applied magnetic field, the magnetic moments of the ferromagnetic particles align themselves parallel to each other to achieve a lower energy state. When a magnetic field is induced on a forming filter cake, the particles form a structured cake aligned with the induced magnetic field. The structured cake reduces the specific cake resistance of the filter cake allowing for an increase in filtration rate of the weakly ferromagnetic hematite ore.