

Effect of Feed Rate on Grinding Circuits and Cyclone Efficiency

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Abstract : The purpose of this paper is to study the effect of change in feed rate on grinding circuit and cyclone efficiency in case of lead-zinc ore. The following experiments and analysis were conducted on beneficiation circuit of Sindesar Khurd (SK) mines under Hindustan Zinc Ltd. subsidiary of Vedanta Group of Companies, a leading producer of lead-Zinc, silver and cadmium (as by products) in India. Feed rate is an important variable in beneficiation circuit operation. Optimizing feed rate is indispensable for any grinding circuit and directly effects cyclone efficiency. The size analysis of ore in grinding circuit along with cyclone efficiency on varying feed rates establishes their interdependence. Feed rate determines retention time ore gets within grinding circuit. Retention time in turn determines degree of liberation of mineral. Inadequate liberation causes decreased circuit efficiency. In this paper we have studied the effect of varying feed rate on (1) D80 particle size of different sections of different streams of grinding circuit (2) Re-circulating load (3) Cyclone efficiency. As a conclusion, this study gives some clues to operate grinding circuits and hydro-cyclones in more efficient way regarding beneficiation of Lead-zinc ore.

Keywords : cyclone efficiency, feed rate, grinding circuit, re-circulating load

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