

Integrated Sensor Based Sorting and HPGR Comminution Circuit for Improved Energy Efficiency

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Energy efficiency is a primary focus for the mineral processing flowsheets of the future. In recent years, High Pressure Grinding Rolls (HPGR) have demonstrated significant energy savings as compared to conventional SAG mill circuits. Investigations have demonstrated the potential for replacement of ball mills with more energy efficient technologies. In parallel, advances in sensor-based sorting (SBS) allow the rejection of low grade rock ahead of energy intensive comminution. The integration of energy efficient comminution with sensor-based sorting has the potential to significantly reduce overall mineral processing energy usage. The paper will present a conceptual SBS with HPGR comminution in tertiary and quaternary stages. The energy consumption will be compared to a conventional SABC circuit for a large copper mine. Results are based on pilot scale HPGR and particle sorting studies, as well as operational information from a mine that uses the MineSense ShovelSense technology.