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Optimize Operating Conditions on Fine Particle Grinding Process with Vertically Stirred Media Mill[1] YANG YANG, NEIL ROWSON, ANDY INGRAM, Univ of Birmingham — Stirred media mill recently is commonly utilized among mining process due to its high stressing intensity and efficiency. However, the relationship between size reduction and flow pattern within the mixing pot is still not fully understand. Thus, this work investigates fine particle grinding process within vertically stirred media mills by altering stirrer geometry, tip speed and solids loading. Positron Emitting Particle Tracking (PEPT) technology is utilized to plot routine of particles velocity map. By tacking trajectory of a single particle movement within the mixing vessel, the overall flow pattern is possible to be plotted. Ground calcium carbonate, a main product of Imerys, is chosen as feeding material (feed size D80 30um) mixed with water to form high viscous suspension. To obtain fine size product (normally D80 approximately 2um), large amount of energy is drawn by grinding mill to break particles through impact, shear attrition or compression or a combination of them. The results indicate higher energy efficient is obtained with more dilute suspension. The optimized stirrer proves more energy-saving performance by altering the slurry circulate.

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