

Effects of Operational Conditions on Fine Grindability and Wear of Grinding Beads in Limestone Bead Milling

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In the present work, the fine grinding of limestone was performed by using a super centrifugal mill (SC-mill), a type of bead mill. The feed sample contained limestone particles below 75 μm in size ground by a crusher mill with a feed slurry density of 30 mass%. The effects of operational grinding conditions in the bead mill including rotor speed, grinding time, grinding bead size, and mass of the grinding beads on the fine grindability of limestone were investigated, as well as the wear of the grinding beads. The fine grindability was evaluated through the mass of products below 1 μm measured using laser diffraction and scattering. The bead wear was investigated through the mass loss of zirconia beads measured using inductively coupled plasma mass spectrometry. In the results, the mass of the fine products and bead wear were found to be proportionally related, and expressed as a function of the operational grinding conditions.

Keywords : Bead mill, Fine grinding of limestone, Wear of grinding beads