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Effect of Poly-sized and Mono-sized Grinding Media on Fine Grinding of Limestone in a Bead Mill

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This study examined the fine grinding of limestone using a bead mill and a circular stirred media mill. Fine grinding characteristics of the bead mill using poly-sized grinding media with a volume mean diameter of 0.5 mm were compared with those observed by mono-sized grinding media with the same mean diameter. The median diameter of the ground particles and the mass of milled products below 1μm can be expressed as functions of the number of rotor revolutions, the mass of the grinding media, and/or the mass of the sample; these relationships were observed for both the poly-sized and mono-sized grinding media. This study showed that the median diameter of particles milled with poly-sized grinding media was more than 10% smaller than that obtained with mono-sized grinding media, and the mass of milled particles below 1μm produced with the poly-sized media was more than 10% greater than that milled using mono-sized media. The use of the poly-sized grinding media in the bead mill led to improvement in productivity of fine particles of limestone.

Key Words : Bead mill, poly-sized grinding media, fine grinding, limestone