

ACOUSTIC CHARACTERISTICS OF INNER CAVITIES OF GRINDING CHAMBER FOR JET GRINDING

Except for refining the processing technology, there is a need for improving the design of the grinding mill chamber to enhance the efficiency and to reduce the power consumption for fine grinding. The work deals with an acoustic pattern of the energy carrier flow into the grinding chamber of a jet grinder, based on studying the basic acoustic emission sources. Zones of the grinding chamber of a jet return-flow mill, which are analogous to regions of the turbulent flow over barriers and cavities, are determined. Vorticity of the energy carrier flow around various cavities is analyzed both at subsonic and transonic speeds.

Acoustic signals recorded in two acoustic characteristic zones of the grinding chamber are examined: at the center of jets collision and in the bottom cavity. It was found that the most strong pressure fluctuations are observed at inleakage of jets on barriers and at collision of two return-flow jets at the chamber center. Pressure fluctuations in various areas of the cavity are analyzed. It is established that the existing approaches are applicable only to some areas of the grinding chamber since the vorticity process is complicated by the opposing flow.

Studies provided the possibility of analyzing the vortex structure of energy carrier flows into the grinding chamber of the jet mill, based on the acoustic signals recorded in grinding.

Keywords: *jet mill, grinding chamber, energy carrier, acoustic signal, turbulent jets, cavity, pressure fluctuation.*

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