

DEVELOPMENT OF THEORY AND TECHNOLOGY OF FINE GRINDING

The research results of the development of a fine grinding theory and a technology for various materials obtained at the Institute of Technical Mechanics (ITM) of the National Academy of Sciences of Ukraine and the State Space Agency of Ukraine are classified. A principally new approach to the fine grinding research is based on the association of the acoustic process parameters with the kinetic and power parameters for decomposing and grinding.

The development of a fine grinding theory provided the validity of some new regularities used as a basis for improving a technological process. In particular, it is found that the intensity of a new surface formation in fine grinding solid mineral resources is proportional to the consumed energy and reduces in reaching some critical product size caused by an increase in particles strength. It is shown that grinding kinetics of the close-cut size of material fractions in mixing does not depend on relationships of other fractions. In theory, it is proved that the final mill productivity in the closed grinding cycle is proportional to the presence of a more sized class than the control one. The maximal mill productivity with a control size class is provided with a limited quantity of a minimal possible product specific surface of the grinded product of a given size.

New results in the fine grinding theory provided the base for use of information technologies of identification of fine grinding conditions to select optimal technological parameters for fine grinding with limited reference data.

Keywords: *fine grinding, technology, specific surface, fineness of particles.*

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