



Research Paper

Segregation of Particulate Solids in a Horizontal Drum Mixer

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Investigation of the mixing of two sieve fractions of sea sand in a horizontal drum mixer have been carried out. An appearance of the distinct axial segregation has been found and the final equilibrium state did not depend on the initial state of mixture. An absence of the radial segregation has been also found in initial end-to-end loading as well as when components were initially randomly mixed.

A mixing of particular materials differing in size, densities and/or shapes is always accompanied by segregation. It may be caused by many different factors and the forms of appearance may be various, depending on properties of components, an initial loading, a mixer design and mixing conditions.

A great number of factors affecting the segregation lead to considerable difficulties. In addition problems arise, well known to the investigators of mixing of particulate solids, with defining the degree of mixing and with sampling. That is why the stress has been laid on fundamental investigations, utilizing simple apparatus in order to identify the basic mechanisms of segregation. Such apparatus are shear cell [1-4] or segregation cells [5,6] and rotating drums - horizontal [7-11] or inclined [12, 13]. Other types of investigation are theoretical considerations, leading to mathematical models of segregation processes [14-16]. Such models are up to the present time, purely empirical and do not reflect the

phenomenon in its full complexity. However, they may be useful in describing the individual processes under the particular conditions for which they were derived.