

# Granular transport through flighted rotary drums operated at optimum-loading: Mathematical model

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## **Abstract**

This paper discusses the transport of granular materials through flighted rotary drums operated at the optimum loading. A mathematical model is derived from the force balance acting on a single traveling particle, to predict the mean residence time of transportation. Based on the available parameters of mean height of falling curtains and final discharge angle, this model can be helpful to estimate the appropriate solid feeding rate. Two steps were followed to implement the use of the model. Firstly, experiments were carried out on a batch rotary drum to obtain the needed input parameters. Then, a case study of a small capacity rotary dryer was considered. In both steps, the drum was operated at the optimum loading. The model results were compared with other correlation from the literature for two cases of solid and air flows: con-current and counter current. Based on the results, a factor is introduced for generalized ...

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