



Research Paper

Wall Pressure-Feeder Load Interactions in Mass Flow Hopper/Feeder Combinations - Part I

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The interactive roles of mass flow bins and feeders are discussed. The effect of feeder speed, gate height clearance between the hopper outlet and the feeder surface, method of filling, rate of filling on wall pressures in mass flow bins and feeder load and power requirements of the feeders are highlighted. Measurement of wall pressures suggests that initial pressures during filling are less than hydrostatic, hence initial loads on feeders are less than theoretically predicted.

The higher experimental flow loads on the feeders are due to the fact that the measured values of wall pressures towards the vicinity of the outlet of the hopper diverge from the radial stress field theory of Jenike. On the basis of the above measurements, the values of K and n are computed and the bounds for initial filling are suggested. The flow loads are based on the major consolidating stress σ_1 , which compares satisfactorily with the measured values. Finally, methods to control overloading of the feeders are discussed.