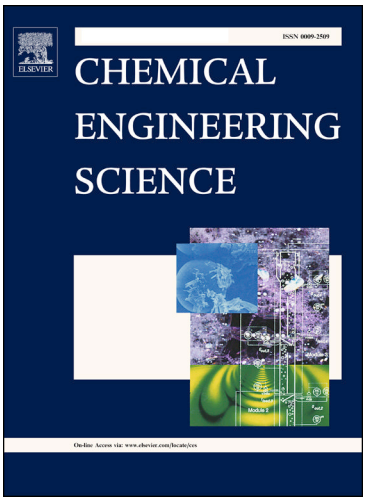

Review

A review on gravity flow of free-flowing granular solids in silos - Basics and practical aspects

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PII: S0009-2509(18)30597-9
DOI: https://doi.org/10.1016/j.ces.2018.08.028
Reference: CES 14443

To appear in: *Chemical Engineering Science*

Received Date: 29 December 2017
Revised Date: 5 August 2018
Accepted Date: 12 August 2018

Please cite this article as: K. Saleh, S. Golshan, R. Zarghami, A review on gravity flow of free-flowing granular solids in silos - Basics and practical aspects, *Chemical Engineering Science* (2018), doi: https://doi.org/10.1016/j.ces.2018.08.028

A review on gravity flow of free-flowing granular solids in silos - Basics and practical aspects

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Abstract

This paper provides a review on the flow of free-flowing coarse particles inside silos. Basic principles and elementary mechanisms involved in gravity flow of granular materials are discussed. The main focus is put on flow patterns, stress distribution, velocity profiles, mass flowrate, Residence Time Distribution (RTD) and segregation inside the silo. A summary of empirical correlations as well as a synthesis of more physical and mechanistic models related to these aspects are presented. Computational and numerical methods used to describe the granular flow of particles will be discussed in a separate paper.

Keywords: Granular solids, silo, hopper, discharge rate, Residence Time Distribution, velocity profiles, flow pattern, segregation

1. Introduction

Gravity flow of powders and granular materials inside hoppers and silos have long been a matter of interest for both academic and industrial communities. If this subject has intrigued

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