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# Influence of air humidity on flowability of various formulated powders

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## Abstract

This work deals with the links between powder formulation and flow properties. The flow properties of glass beads have been analyzed after various surface treatments leading to hydrophilic, hydrophobic and lactose-coated surfaces. Moreover, in order to investigate the influence of powder core composition, agglomerated lactose powders of circa 100  $\mu\text{m}$  mean particle size has been also produced by high-shear wet granulation and characterized. Particle size distribution of untreated and surface-modified glass beads, as well as agglomerated lactose powders were determined by laser diffraction granulometry. The hydrophilic and hydrophobic surface treatments does not modify the size of the particles. Moreover, the Scanning Electron Microscopy (SEM) shows that the hydrophilic and hydrophobic surface treatments did not alter surface topography. On the contrary, lactose-coated glass beads and agglomerated lactose powders presented noticeable surface modifications together with size enlargement. In the current study, the influence of air humidity on flow behavior of aforementioned formulated powders was investigated. In this aim, control glass beads, hydrophilic glass beads and hydrophobic glass beads (resp., agglomerated lactose and lactose-coated glass beads) have been kept during 2 days (resp., one week) at 50 % relative humidity. The flowability of powders which have been measured with FT4 rheometer showed that all the samples were easy-flowing also they have been compared with the results which obtained already for the powders without humid control (30% of humidity). The shear cell result showed that lactose coated glass bead has highest flowability in both case with and without humid control.

**Keywords:** glass bead, latose agglomeration, surface formulation, flowability, humid control

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