

MATERIAL HANDLING – HAVING TROUBLE WITH POWDER IN BAGS?

A recurring problem that can plague manufacturers of powder based materials is the formation of clumps in the product after having been bagged and shipped to customers. One of the causes leading to the formation of clumps in the material is the natural consolidation process which takes place when bags are stacked on top of each other. This means that the self weight of the powder in the bags at the top of the stack can apply enough pressure on the bags at the bottom to force the powder particles to bind together and form stable structures like clumps.

Is this predictable? The answer is yes. How you ask? A proven scientific method which employs shear cell technology is able to show clearly the build up in strength of a powder as a function of increasing consolidation pressure. (See Figure 1)

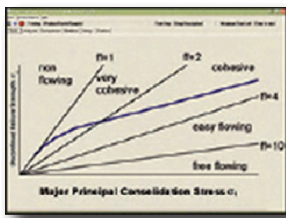


Figure 2: Flow Function shows how Powder Strength changes with increasing Consolidation Pressure

The standard test method is to apply pressure to a sample of the powder and measure the strength of the powder at that pressure. The picture of



Figure 1: Brookfield Powder Flow Tester uses Shear Cell Principle

how a powder behaves over a range of increasing pressures is shown in a graph called the “Flow Function”. (See Figure 2)

If the powder is cohesive by nature, then the consolidation process can result in the formation of clumps. The Flow Function test method provides a useful output parameter called the “Arching Dimension” which is a numerical value that can be related to the maximum size of the clumps that form. One added capability that comes with the shear cell is testing for consolidation of the powder over an extended time period. This simulates what happens to bag products kept in storage.