

The storage, handling and transport of solid materials are common operations throughout the chemical process industries (CPI). In some industry sectors, the bulk of the raw materials and products may themselves be solids and in these industries, solids handling and processing play a predominant role in manufacturing. Examples are the pharmaceutical, food-and-beverage, polymer and mining industries.

In almost all of the CPI, however, some handling of solids is needed — whether it is the raw materials, byproducts or products — and knowledge of solids-handling principles and techniques is therefore required throughout the CPI. Typical subjects that *Chemical Engineering* features in this area include monitoring solids flow and level, blending and segregation, feeding and conveying, characterizing particle size and shape, and handling of fine powders including safety and environmental considerations.

In June 2019, *Chemical Engineering* will publish the Solids Processing 2019 Special Ad Section. Advertisers running a ½ page or larger ad will receive a bonus ½ page advertorial write-up. This is the most economical way to get your message into the hands of the CPIs critical decision-makers.

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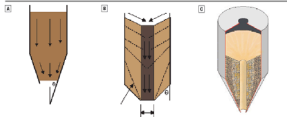
Within reason you are welcome to use your editorial space in any way you wish. However, we have a few “house rules” to provide a consistent look across the section and reinforce the impression that this is independent editorial written by a journalist, rather than advertising. So please:

- Send Sophie Chan-Wood <schanwood@accessintel.com> one or two illustrations and 350–400 words of text for a standard half-page editorial.
- Be aware that we will edit your text to house style, and shorten it if this is needed to fit the space. We will always send you a proof to check before publication.
- Write in the third person (for instance “the company” or “YourCorp., Inc.” instead of “we”), and don’t address the reader directly.
- No ® or ™ symbols, please. They never appear in standard magazine editorial.
- If possible, include a headline that will comfortably fit the available space. For a standard half-page of editorial this is likely to require 35–48 characters, but check a sample copy. Smaller editorials and vertical layouts will need fewer characters. The head should not include your company or product name.
- Similarly, it helps to include a deck (subhead) of roughly the right length. For a standard half page this is generally 130–160 characters; again, check a sample copy. The deck should include your company name; product names are optional.
- One illustration is normally enough, though it’s sometimes possible to use two small ones. A single large illustration can look striking, but there is a trade-off with the length of the text (which is one reason why it’s hard to be precise about word counts).
- Please try to include a caption for your illustration, especially if it shows a particular product or plant. Make sure you have copyright clearance for your illustration.
- Illustrations can work well in either landscape or portrait orientation; landscape gives more flexibility with layout. Cutouts (vignettes) against a plain background or with clipping paths are welcome.
- We can handle most graphics file formats, but for photographs a good-quality hi-res CMYK JPG suitable for printing at 300 dpi is fine. Please send illustrations as separate files, not embedded in Word documents.
- For diagrams and charts, vector artwork (Adobe Illustrator or vector PDF) is much preferred. Remember that graphics with narrow lines and small text do not work well at small column widths.

Solids Processing

Solids Discharge: Characterizing Powder and Bulk Solids Behavior

How shear-cell testing provides a basis for predicting flow behavior




Robert McGeer
 Divulard Engineering Laboratories

Powder jars are the venerable workhorses of powder flow characterization. In solid flow, they provide a simple, repeatable means to assess whether a powder will flow under a given set of conditions. However, the information they provide is limited. In order to understand the underlying mechanisms of powder flow, researchers have turned to shear cell testing. This technique provides a more detailed view of the forces that govern powder flow, allowing for a more accurate prediction of flow behavior.

Shear cell testing involves the application of a controlled shear stress to a powder sample contained within a cell. The resulting flow behavior is then measured and compared against theoretical models. This process allows for the identification of flow regimes and the prediction of flow characteristics under various conditions.

There are several types of shear cells used in research and industry. Each type has its own advantages and limitations. For example, some cells are better suited for studying the flow of fine powders, while others are more appropriate for coarse materials. The choice of cell depends on the specific requirements of the study.

By understanding the underlying mechanisms of powder flow, researchers can develop more effective strategies for powder handling and processing. This knowledge is essential for the design of efficient powder handling systems and the optimization of industrial processes.



It is needed to allow the powder to discharge from the cell in a controlled manner. The test results are then used to predict the flow behavior of the powder under various conditions.

Figure 1 illustrates the basic principle of shear cell testing. A powder sample is placed in a cell, and a shear stress is applied. The resulting flow behavior is then measured and compared against theoretical models.

Figure 2 shows a typical shear cell testing setup. The powder is contained within a cell, and the shear stress is applied through a series of blades. The resulting flow behavior is then measured and compared against theoretical models.

Figure 3 illustrates the basic principle of shear cell testing. A powder sample is placed in a cell, and a shear stress is applied. The resulting flow behavior is then measured and compared against theoretical models.

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