



Optimization of Powder Properties for Flowability

DIRECTED BY

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ACCREDITED
COURSE

- Obstructions to flow
- Solids flow patterns
- Flow property testing
- Analysis of flow property test results to predict powder flow behavior
- Design and selection of reliable hoppers and feeders

about the course

There are several metrics that formulators use to quantify the flowability of powder blends, including angle of repose, Carr and Hausner ratios, FFC, and flow energies. They all have one thing in common: none will predict whether or not a powder will flow in a hopper. Frequently powders that are deemed easy flowing exhibit flow problems such as bridging, ratholing, or erratic discharge.

Many laboratories are equipped with shear cell testers, which measure the fundamental flow properties of powders, i.e., cohesive strength, internal friction, compressibility, and wall friction. Together with permeability test results, a formulator can determine if a hopper has an outlet large enough to ensure unobstructed flow and allow the desired discharge rate and the hopper angle required to prevent a rathole from developing. Alternatively, an investigator can use the test results to design or choose a bin or hopper that will provide reliable flow.

This fully accredited 6-hour course will cover fundamental powder flow properties, testers that measure them, and what inputs should be used to obtain the most valuable test results. Anyone who owns a shear cell and permeability tester should never have a powder flow problem.

Since this training is highly interactive, those attending the live training event must have a webcam on their computer as well as a microphone and speakers/headset in order to fully participate.

who should attend

This course is intended for professionals within the pharmaceutical industry. It will be especially valuable to personnel that work with oral solid dosage form excipients, Active Pharmaceutical Ingredients (API's), and blends in the following areas:

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- Formulation
 - Scientists
 - Laboratory Technologist
 - Managers and Supervisors of the Personnel will also benefit from this training by learning the challenges faced by them
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- GMP
 - Engineers
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learning objectives

Upon completion of this course, you will be able to:

- Identify the fundamental flow properties of powders
- Select inputs on shear cell testers that will provide the most useful results
- Utilize the test results to determine if a bin or hopper is appropriate for your formulation or if it will likely arch or develop a stable rathole
- Determine if the size of your hopper outlet will allow the required solids discharge rate

course outline

Review of Learning Objectives

Obstructions to Flow

- Common powder flow problems

Solids Flow Patterns

- Bins and hoppers
- Stresses

Powder Flow Property Testing

- Cohesive Strength
- Compressibility
- Wall Friction
- Permeability

Analysis of Flow Property Test Results

- Prediction of Powder Flow Behavior
- Design and Selection of Reliable Bins and Hoppers

Feeder Selection

Tricks for Challenging Materials

Segregation

Caking

Question and Answer Session

Assessment Opportunity

course instructor

Greg Mehos, Ph.D., P.E. is the director of Greg Mehos & Associates LLC and is a chemical engineering consultant who specializes in bulk solids handling, storage and processing and an adjunct professor at the University of Rhode Island. Greg enjoys teaching professionals and students bulk solids engineering fundamentals so that they can solve powder handling problems and design equipment for reliable handling of solids. He has authored dozens of technical papers on the subject and contributed to the Solids Processing and Particle Technology section of the ninth edition of Perry's Chemical Engineers' Handbook. He received his B.S. and Ph.D. in chemical engineering from the University of Colorado and his master's from the University of Delaware. Greg is a Fellow of the American Institute of Chemical Engineers and a past chair of the Boston local section. He is a licensed professional engineer in Massachusetts.

Accreditations



International Accreditors for Continuing Education and Training (IACET)

Cobblestone has been approved as a CEU Accreditor by IACET and awards CEUs for participation in qualified courses. Cobblestone has demonstrated that it complies with the ANSI/IACET Standards and is authorized to offer IACET CEUs for its programs. CEUs will be awarded for participation in Cobblestone's courses at the rate of .1 CEU per contact hour upon successful completion of the entire course and 70% accuracy in the required Learners' Assessment. A minimum score of 80% is required for all courses within a Cobblestone Certification Program. This course offers a total of 6 contact hours, or .6 CEUs. For further information, visit www.iacet.org

The American Institute of Chemists (AIC)

The National Certification Commission in Chemistry and Chemical Engineering was formed in 1977 to recognize practitioners who strive to maintain their professional competence through participation in continuing education. The program encourages various means by which practitioners can maintain and improve their skills. It also serves as a vehicle for formally recognizing educational programs and other professional related activities that are dedicated to advancing the chemical scientist's or engineer's current competence in his/her discipline.

This and many other CfPA courses offer training that may be helpful in obtaining required AIC recertification education units. A list of recommended courses can be found on <https://www.cfpa.com/Accreditation/AccreditationView/AIC>.

For more information, visit: www.theaic.org