SUPPLIERS' TIPS

How can I improve my mixing operation's efficiency?

Myriad factors both positively and negatively influence successful mixing efficiencies. For example, charging methods and food port locations, raw ingredient conditions, addition sequences, and discharge techniques can and do contribute to the overall mixing operation's efficiency. Even environmental issues such as temperature and humidity can play a significant role.

Pay attention to the recipe or formula, especially the various ingredient percentages and raw ingredient characteristics. Material characteristics such as particle size distribution, particle shape, loose bulk density, angle of repose, particle integrity requirements, and temperature constraints are important to consider when selecting the most effective and efficient mixing system.

It's also important to identify and test different mixing technologies to select the most appropriate technology for your specific application.

Richard Zak, vice president—sales, American Process Systems, 847-406-1307

Maximum mixing and blending efficiency is obtained by accurate, repeatable, and controlled ingredient flow into the mixer or blender using the best feeding equipment and technology available.

Robert Kolatac, national technology manager, Metalfab, 973-764-2000

How can I prevent my ingredients from segregating during mixing?

To prevent ingredients from segregating during mixing, establish a minimum and maximum mixing time. The batch should be discharged within these parameters to ensure uniformity. It's also important for particles to be randomly distributed during mixing. All particles should have uniform mobility and randomly flow during mixing so that they can move freely about the mixer vessel. Keep in mind that a mixer that's too aggressive or has an elongated mix time can create heat, degradation, and static electricity charge, all of which inhibit random particle movement. Finally, uneven liquid dispersion into the batch can create agglomeration. Some of the saturated ingredients become lumpy and tend to clump together, while other particles remain dry and flow unimpeded, resulting in segregation. Make sure the liquid is dispersed evenly over your materials to prevent this from happening.

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When you use a pneumatic blender, segregation sometimes occurs during the discharge cycle. To minimize this segregation, it's often effective to inject a few pulses of compressed gas during discharge. This "reblending" feature helps effectively mix materials without causing segregation. To accomplish this, you must be able to stop the material flow during discharge. You can use a butterfly valve for this purpose, or, if you require continuous flow, you can use a rotary feeder.

Mike Weyandt, corporate sales manager, Nol-Tec Systems, 651-780-8600

While there are several ways to improve mixing efficiency, you should start by checking whether the mixer or blender is the best choice for your application. For example, ribbon or paddle blender agitators have to force their way through material, requiring more energy and longer blending times than tumble mixers. If you're mixing free-flowing materials, installing a tumble mixer in place of an agitated blender can not only reduce mixing times, but also improve energy efficiency.

For large production runs of the same materials, continuous operation is typically more efficient than batch operation. With inline continuous mixing, much of the material handling and labor necessary for batch operations can be avoided and the overall footprint can be reduced.

Review your feeding and collection methods as well as mixing times, which can be checked with CV tests, to ensure that the mixing cycle isn't longer than it has to be. If you must clean between material runs, see if another cleaning method could lower downtime.

Stephen J. Knauth, marketing manager, Munson Machinery Co., 800-944-6644

Equipment suppliers are a valuable source of information about equipment and processes. In light of this, we occasionally ask suppliers a question of concern to our readers. Answers reflect the suppliers' general expertise and don't promote the suppliers' equipment. If you have a question you'd like suppliers to answer, send it to Alicia Tyznik, Associate Editor, Powder and Bulk Engineering, *1155 Northland Drive, St. Paul, MN 55120; fax 651-287-5650 (atyznik@cscpub.com).*