

New product guide from Glen Mills available now! Jar Mills, Jars & Media

Ball and jar mills are the mainstay of many labs and production facilities. Applications are numerous: grinding of crystalline drugs in a pharmaceutical R&D lab, grinding of rock and soil samples for an oil services company, deagglomeration of pigment particles for a paint company and many more. When correctly applied ball mills can achieve levels of size reduction unobtainable by other methods - results to 1 micron and smaller are possible. The relative low cost of lab sized jar mills make them the perfect starting point for research, knowing they are easily scaled up makes them doubly attractive.



This new bulletin from GLEN MILLS lists our range of standard jar mills and jars, including sizes and relative costs and availability. There is a short section on the theory of ball milling and we discuss the difference between low and high-energy ball mills. The bulletin also provides an introduction to the world of grinding media - typically thought of as the balls of the ball mill, although media is available in a variety of shapes and materials. Call 973-777-0777 or e-mail staff@glenmills.com to request your copy.

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Glen Mills, the helpful experts in sample prep.

1. Mixing small amounts in a bulk lot (mixing A into B)
2. Blending small diameter particles with larger grains
3. Mixing materials of different densities

THE *dyna*®-MIX

The 3-dimensional rotation of the new *dyna*-MIX from GLEN MILLS provides

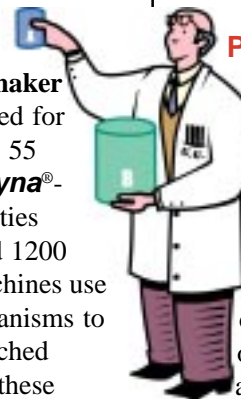
Glen Mills® Tech Tips Issue 7

Options for 3D Mixing

GLEN MILLS offers two machines that eliminate many of the concerns facing users of powder blending and mixing equipment - slow mixing times and cleaning issues with conventional tumbling mixers and sealing and maintenance issues with internal agitator models. The

TURBULA® Shaker-Mixer is offered for capacities up to 55 liters and the *dyna*-MIX for capacities between 50 and 1200 liters. Both machines use precision mechanisms to produce unmatched mixing even in these difficult applications:

the ultimate solution to your mixing requirements. The *dyna*-MIX, which allows you to use any size or shape of container, rotates the material on all 3 axes thereby reducing mixing times and simultaneously resulting in a superior blend.



PRINCIPLE OF OPERATION

The *dyna*-MIX is based on the same operation principle as a gravity mixer, in which the mixing vessel circulates around one axis to achieve a mix that is often

referred to as "free-falling." Designed primarily for free-flowing formulations, gravity mixers use the force of gravity, rather than an internal mechanism, to pull and blend the mix.

continued inside

Mixing the impossible to perfection; *dyna*-MIX & Turbula

The *dyna*-MIX improves on this design by using three axes rather than two to accomplish the mixing process. The container is mounted on a hinged universal joint, and the mixing vessel rotates around both the X (inner) and Y (outer) axes. The direction of rotation of the internal and external shaft changes periodically, and each shaft is driven at a predetermined rotational speed after every direc-

tional rotation change. Due to the intrinsic design of the three-dimensional motion, the homogeneity of the mix does not depend on the size or shape of the vessel; instead, the energy input is distributed proportionally throughout the entire volume of the vessel, ensuring a gentle, constant and reproducible mixing process at all times. The addition of the third axis tremendously increases the effectiveness of the mix, both in speed and uniformity, and eliminates the need for internal agitation.

SELF-CONTAINED MIXING

Unlike most conventional mixers, which require that the materials be placed into the machine's own mixing vessel, the *dyna*-MIX will handle the container of your choice, whatever the size or shape. A sleeve can be constructed for each container that will be used on the machine, and the clamping device for these containers can be adapted to meet specific mixing needs. Open containers

can also be used, an automatic locking device affixed to the machine cover seals the container during the mixing process. Mixing in self-contained vessels allows mixing, storing and transporting without transferring the product, thereby eliminating cleanup, additional labor costs, product loss, dust emissions from the vessel and the possibility of cross-contamination between products. Blending in removable containers prevents segregation that may occur when discharging from conventional mixers.

VERSATILITY

Due to its versatile nature, the *dyna*-MIX can be used to enhance mixing capabilities in a variety of applications. Although the *dyna*-MIX is primarily designed to mix solids, it can also successfully handle emulsions (liquid-liquid) and dry powder or granulates mixed with a small amount of water, thin liquid oils or solvents, as long as the product on the whole remains dry. The *dyna*-MIX's intense mixing action and atomization capabilities ensure that the product is moistened homogeneously, making it useful for chemical additives, dopants and other dry-liquid applications. The *dyna*-MIX has already been successfully used to mix materials for powder coatings, dental ceramics, glass, batteries and other applications.



dyna-MIX 100
(100 liters)

eliminating cleanup, additional labor costs, product loss, dust emissions from the vessel and the possibility of cross-contamination

TURBULA® SHAKER-MIXER

The *dyna*-MIX is the big brother of the very successful **TURBULA® Shaker-Mixer**, over 15,000 of which have been sold worldwide since the 1950's. Ideal for lab and small production powder blending applications the **TURBULA** is available in three sizes from 2 to 55 liters. Both the 2 and 17 liter machines use a system of twisted rubber clamping rings that will hold any form of container from a test tube up to the full nominal volume. As with the *dyna*-MIX, this ensures that contamination between samples is eliminated - each sample stays in its own closed container. Adjusting the speed on all three machines is simply a case of changing the position of a drive belt on an easily accessible pulley assembly (Variable speed option available on some models).



TURBULA T2F
(2 liters)

SEE FOR YOURSELF

We invite you to visit our web site where the unique motions of both the *dyna*-MIX and the **TURBULA** have been brought to life. Details in the Product Showcase at www.glenmills.com.

RUNNING TRIALS

GLEN MILLS makes both machines available for trials, either in our lab or in yours, anywhere in North America. Rent, lease or purchase - you make the choice.

This article is adapted from articles published in *Ceramic Industry* October 2002 and *PCI* May 2003. Copies of the full article are available upon request.

Report from Pittcon 2003 Orlando, FL

Thanks to everyone who came to the booth to either enter the prize drawing or just to say hello. We weren't really sure of the response we'd get to our prize drawing promotion, but it worked out great.

We met a lot of people who had nice things to say about us, our equipment, even the Grinding Guy!

The winner of the \$25,000 - Toooooo sorry we mean \$250 prize drawing is

Aubrey Smith of Macon, GA.

To our winner, "Congratulations!"

and we look forward to meeting more of you next year in Chicago!



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