



Experts in Solid
Dosage Technology

A Division of *Spraying Systems Co.*

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The Best in High-Shear Granulators

A high-shear granulator or high-shear mixer uses a rotating impeller or high-speed rotor (or both) to create flow and shear. High-shear granulation is an effective way to turn powders into dense granules for tableting or coating. To create the granules, powders are added to the mixing bowl and the bowl is sealed. A large impeller rotates at slow speeds, spinning the powders into a vortex. After the powders are blended together, liquid is added to the product using a pump or pressurized container. A high-speed chopper tool located in the bowl shears the granules and removes air. The mixing continues until the desired granule size and density are achieved. Mixing processes vary from each application so when searching for a mixer, here are some key features to look for that can optimize your process and maximize your batch.

1. LOOK FOR FLEXIBLE BOWL CONFIGURATIONS

Look for bowl geometry that greatly impacts the efficiency and permits working volumes from 30 – 90% of full capacity - many models max out at 66 – 75%. The design of the impeller and chopper is critical to creating an even mix. The impeller lifts the product directly into the line of the chopper. This, combined with the binder, creates the desired granule size and density.

2. MIXERS THAT ARE EQUIPPED WITH AUTO-CLEANING AND LIFTABLE TOOL SYSTEMS

Mixers that are equipped with auto-cleaning (WIP) and liftable tool features, save much time in cleaning while reducing set-up time, most important it reduces downtime between batches. The liftable tool system raises the impeller 4-8" to permit inspection or swabbing of the impeller bottom, seal and bowl bottom.

3. CHECK TO SEE WHERE THE IMPELLER AND CHOPPER ARE LOCATED

The proper design of the impeller and chopper are essential in the mixing efficiency and where they are located. The best performance is if the impeller is bottom-driven and a side-mounted chopper, this will eliminate dead spots, and ensures the material is uniform in this configuration. Having a consistent impeller tip speed, along with bowl geometry, ensures scale-up from R&D through production.

4. ELLIPTICAL OR DOME SHAPED LIDS

Elliptical or dome shaped lids permits product to perform a complete roll over, ensuring a homogeneous mix in a variety of formulations, minimal clean-up and aids the batch yield even when running at larger operating capacities.

5. END POINT ACCURACY

The ultimate goal of any measurement in a granulation process is to estimate the density of the granules, and, perhaps, to obtain an indication of the particle size mean and distribution. These variables provide information for end point determination, reproducibility and scale-up. End point accuracy is achieved by a variety of methods; torque, power consumption and amps.

6. EFFORTLESS LOADING AND UNLOADING

A variety of loading and unloading systems can be designed, for better material handling. The multi-stage seal purging system permits operating at low and high seal flows. This helps prevent dusting when loading and allows setting of the flow to match product characteristics.

7. A HYDRAULIC SYSTEM

For larger-scale mixers, a hydraulic drive system permitting full torque down to ¼ RPM providing plenty of break-out torque at slow speeds for additional mixing after inspection and continuous discharging to wet milling systems.