Mixing Characteristics

top

Tank Design Tips

Mixing Characteristics

Tank Design Tips

1. Generally, round is preferable to square or rectangular.
2. Baffled tanks and/or eccentric mounted mixers/agitators provide the best mixing action where vortex is not required.
3. An unbaffled cylinder provides the best vortex potential to mix solids.
4. If you must use a square or rectangular tank, center mount your mixer.

Mixing Characteristics

Mixing is a key operation for many food processors - a necessity when two or more ingredients must be blended together. We are often asked the definition of ***mixing*** versus ***agitation*** or ***blending.*** Sounds simple enough, but not so when you add other "mixing" terms such as ***dispersing, hydrating, suspending*** or ***emulsifying*****!** In other words, depending upon the ingredients involved, "mixing" or "blending" may not properly describe the operation required. The following are brief descriptions to define each situation:

Mixing:

The generic term for the operation encompassing all the variations that follows.

Agitating / Blending:

Typically a low speed blending operation with a ROTOFOIL impeller, or RAPIDEX marine type propeller.

Dissolving:

Where the dissolution of a solid in a liquid is necessary, as with salt or sugar solutions. Simple higher speed agitation techniques are normally sufficient, although high shear techniques are needed when other solids may block dissolution of the primary solid. Typically a high speed mixing operation with a ROTOSOLVER or a ROTOSTAT mixing head.

Dispersing:

Mixing of two immiscible liquids, or a solid into a liquid to make a stable mixture. Dispersions usually involve reducing the size of particles and agglomerations to allow more particle surface area to be wetted out. An example would be liquid vitamins or corn syrup solids into water. Typically a high speed mixing operation with a

ROTOSOLVER or a ROTOSTAT mixing head.

Emulsifying:

Similar to creating dispersions, but emulsions are more stable and complete. May be an "oil in water" emulsion where water is the continuous phase and oil is the dispersed phase, or "water in oil" emulsion, which is the opposite. Oil in water emulsions is the more difficult, and high-energy high shear mixers are necessary. Mayonnaise is an oil in water emulsion. Typically a high speed mixing operation with a ROTOSOLVER or a ROTOSTAT mixing head.

Hydrating:

Many ingredients are used as binding agents or stabilizing agents by "swelling" when activated under high shear, and attaching to other solid or liquid molecules. Hydrating hydrocolloids such as gums, carrageenan, CMC, etc. can be very difficult without the proper high shear equipment. Typically a high speed mixing operation with a ROTOSOLVER or a ROTOSTAT mixing head.

If any of these mixing operations fit *your* requirements, or if you have been struggling with a low speed agitator where high shear equipment may be more appropriate, call us for more information on the ROTOSTAT or ROTOSOLVER, which are especially engineered for the difficult-to-process ingredients.

Go to top of page