Key insights to preventing air incorporation and removing air in mixing processes

Key factors to consider when selecting a mixing solution include how well the solution prevents air incorporation during the mixing process and how effectively it removes any remaining air from your product. Air in your products and your process leads to a number of undesirable consequences. It causes foam to form, risking cavitation that could destroy your pumps. It creates more fouling in your heat exchangers and makes CIP and filling more difficult and time consuming. Air also compromises the stability and shelf life of your products, as well as their quality, by causing off-flavours and oxidation of nutrients. Here's what to keep in mind to minimize air and ensure product quality, food safety and efficient mixing.

Eliminate air in your ingredients

- Vibrate your powder ingredients to remove air between powder particles before mixing.
- Ensure that your powder hopper is designed to prevent new incorporation of unwanted air.
- Deaerate your liquid ingredients before mixing.

Use a vacuum tank

- Mixing in vacuum tanks eliminates unnecessary air that could be incorporated into your products.
- In a vacuum air bubbles expand in size while bubble density is decreased, allowing air bubbles to rise to the surface and be removed more quickly.

Avoid adding air when you add ingredients

- Air in the product creates a foam layer that cannot be pumped or used, increasing product waste and leading to all the undesirable consequences.
- Introduce de-foaming ingredients first, such as oil. These make it harder for foam to form since they reduce surface tension.
- Make sure that your powder conveying pipe is designed for the least possible resistance so you don't need to add air to convey your ingredients between the powder hopper and mixing unit.
- Prevent splashing, since splashing also contributes to creating foam in the product. Look for properly designed inlets that eliminate splashing. Your ingredients should flow smoothly into the tank, or be injected through inlets below the product surface.

- Check and change gaskets regularly to ensure that there are no leaks in your tank or at the inlets of pumps to prevent unwanted air incorporation.

Minimize – or even prevent a vortex

- A vortex in a mixing tank risks causing unwanted air to be mixed into your product.
- The right mixing head can control and minimize the formation of vortex just by ensuring it never reaches all the way down to the impeller and begins to mix in unwanted air.
- If both the mixing head, tank and baffles are designed together you can effectively control the vortex size.

Achieve effective deaeration

- Look for a deaerator with the largest surface area, enabling the shallowest product layer.
- The air bubbles won't have to rise as far to the surface before they are removed – and a larger surface area is exposed to the vacuum force in the tank, meaning any air removal is faster and more complete.

Air in the product leads to foam formation, which causes major problems for you downstream.

It negatively affects product quality, food safety and the efficiency of your process. Often a dedicated downstream deaeration unit is necessary.

But with the right mixing solution you eliminate the need for this extra equipment and you secure your production.